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Vol. 58 NOVEMBER, 1931 No. 8

Bulletin

of the

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Published for the Club monthly except
July, August, and September
by
GEORGE BANTA PUBLISHING COMPANY, MENASHA, WISCONSIN
Subscription price $6.00 per year

Entered as Second Class Matter at the Post Office at Menasha, Wisconsin
Accepted for mailing at special rate of postage provided for in the act of February 28, 1925, embodied in paragraph 4, section 412, P. L. and R., authorized July 23, 1928.

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Bulletin. Established 1870. Monthly, except during July, August, and September. Price, $6.00 a year; single numbers 75 cents. Of former volumes, only 24–56 can be supplied separately; certain numbers of other volumes are available, but the entire stock of some numbers has been reserved for the completion of sets. Manuscripts intended for publication in the BULLETIN should be addressed to Dr. Tracy E. Hazen, Barnard College, Columbia University, New York City. The editors may accept papers up to 20 pages in length, with illustrations and tabular matter generally not exceeding twenty per cent of that amount. Longer and more copiously illustrated papers, however, may be published if the excess pages, illustrations, and tabular matter are paid for by the contributors.

Torreya. Bimonthly, established 1901. Price, $1.00 a year. Manuscripts intended for publication in TORREYA should be addressed to Mr. George T. Hastings, Editor, 2587 Sedgwick Ave., New York, New York.

Memoirs. Occasional, established 1889.

Preliminary Catalogue of Anthophyta and Pteridophyta within 100 miles of New York City, 1888. Price, $1.00.

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Botanical results of the Tyler-Duida Expedition

H. A. Gleason

(*Continued from the October issue*)

LABIATAE[1]

Lowland species

Hyptis atrorubens Poit. In second growth, Santa Isabel, northern Brazil, *84;* throughout the American tropics from Mexico and the West Indies to Peru and Brazil.

Hyptis Parkeri Benth. East swamp at Esmeralda, *255;* also known from British Guiana and Amazonian Brazil.

Hyptis Parkeri Benth., var. **verbenaefolia** (Mart.) Epling, comb. nov. (*Hyptis verbenaefolia* Mart. Fl. Bras. **8**[1]: 110. 1858.)

River banks and flood sands, Muyrapenima, northern Brazil, *74;* British Guiana and Brazil.

Hyptis recurvata Poit. In second growth, Santa Isabel, northern Brazil, *1060;* throughout the American tropics from Mexico and the West Indies to Bolivia and Brazil.

Marsypianthes Chamaedrys Briq. In second growth, Santa Isabel, northern Brazil, *92;* widely distributed throughout tropical America from Mexico and the West Indies to Bolivia and Paraguay.

SOLANACEAE[2]

Lowland species

Solanum umbellatum Mill. In forest at Santa Isabel, northern Brazil, no. 87. I have seen no other specimens from South America, but its occurrence there is not surprising. I can not separate it from Central American plants of the same species.

Species of Mount Duida

Cestrum tenuiflorum HBK., var. **glabrescens** Morton, var. nov. Arbuscula, ramis ramulisque teretibus glabris; foliis brevipetiolatis ellipticis utrinque acutis, glabris, venis lateralibus circa 5; inflorescentia axillare spicata, foliis fulcrantibus deciduis quam foliis minoribus; floribus sessilibus; calyce

[1] By Carl Epling.

[2] By Conrad V. Morton.

[The Bulletin for October (**58**: 405–464) was issued 22 December 1931.]

dentato coriaceo glabro ciliolato; corollae tubo gracile utrinque glabro superne ampliato lobis subulatis intus tomentulosis marginibus incurvatis; filamentis glabris edentatis; antheris parvis; ovario glabro stipitato; baccis subglobosis papillosis; seminibus 3-angulatis.

A small tree, the branches and branchlets terete, glabrous; leaves petiolate (petiole 1–2 cm. long, glabrous), 6 by 2.5 cm. to 13 by 6 cm., acute at both ends, green and glabrous on both sides, secondary veins about 5; inflorescence of short axillary spikes, the subtending leaves reduced in size, deciduous in age; rachis glabrous or very minutely reddish-puberulent; pedicels obsolete; calyx 2 mm. long, shallowly 5-dentate, coriaceous, glabrous, ciliolate, in fruit shallowly and irregularly lobate, subtending about one fourth of the berry; corolla-tube white (Tate), 20 mm. long, 1 mm. wide at base, gradually wider above (2 mm. at throat), glabrous within and without, lobes 5, subulate, 3 mm. long, tomentulose within, the margins incurved; stamens 5; filaments glabrous, without teeth or appendages, adnate to the corolla-tube for 15 mm., the free portion 2–3 mm. long; anthers small, less than 0.5 mm. long; style slender, 17 mm. long, glabrous; stigma flattened; fruit subglobose, green (Tate), 6 mm. in diameter, papillose; seeds 3-angled, 3 mm. long.

At Agüita, 3100 ft., *885*. The typical form of the species, which is also from Mount Duida, is a shrub with the leaves tomentulose on the veins beneath, filaments slightly pilose at base, and stigma subcapitate. Schultz has reduced it to varietal rank under *C. latifolium*, but almost certainly incorrectly so.

SOLANUM sp. A species of the section *Leiodendron*, with lanceolate, long-acuminate leaves and green berries, was collected at Agüita, 4000 ft., *920*. It is not identifiable without flowers.

SCROPHULARIACEAE[1]

Lowland species

NAIADOTHRIX REFLEXA (Benth.) Pennell. In the East Swamp at Esmeralda, *252;* also known from northern and central Brazil.

BUCHNERA PALUSTRIS (Aubl.) Spreng. Unflooded grassy swamps at Esmeralda, *175;* chiefly on savannas, from the Guianas to Bolivia.

GESNERIACEAE

Species of Mount Duida

Episcia cordata Gleason, sp. nov. Caulibus subrepentibus parce pubescentibus; petiolis elongatis crassis densiuscule pilis articulatis pubescentibus; laminis oblongo-ellipticis obtusis vel subrotundatis crenatis basi cordatis

[1] By Francis W. Pennell.

utrinque pubescentibus; paniculis confertifloris dense pubescentibus; sepalis distinctis oblongo-lanceolatis 3-nerviis intus basi villosis extus inferne hirsutis superne subglabris, antico deflexo quam posticis 4 erectis angustiore; corolla pubescente tubulosa basi calcarata, calcare rotundato, tubo superne dilatato, limbo patulo lobis integris rotundatis; staminibus ad basin corollae insertis, filamentis elongatis curvatis, antheris in juga 2 approximatis, thecis ovatis apice confluentibus; disco triangulare dorsale; ovario villoso libero.

Stems herbaceous and spreading, apparently pubescent chiefly near the nodes; petioles stout, at maturity as much as 8.5 cm. long, freely pubescent, especially on the dorsal side, with crooked jointed hairs 1–1.5 mm. long; blades firm, dark green, oblong-elliptic, as much as 13 cm. long by 5.5 cm. wide, obtuse or subrotund at summit, conspicuously crenate and ciliate with hairs like those of the petioles, cordate at base, scabrously pubescent above, the crooked hairs tending to be aggregated in the center of the vein-areoles, sparsely pubescent on the veins beneath; veins obscure above, plane but conspicuously reticulate beneath, the laterals 10–15 mm. apart and arcuately ascending; inflorescence a short, crowded but few-flowered, terminal or subterminal panicle, sessile or nearly so; pedicels short, densely hirsute with hairs like those of the petiole; sepals 5, separate to the base, lance-oblong, 3-nerved, reticulately veined, sparsely villous within near the base, densely hirsute without in the basal half with spreading hairs 1.5 mm. long, the distal half nearly glabrous, the posterior 4 erect, 9 mm. long, nearly 3 mm. wide, with about 2 teeth on each side near the apex, the anterior one strongly deflexed behind the corolla-spur, 7.5 mm. long, nearly 2 mm. wide, sharply dentate near the apex; corolla tubular, 6 cm. long; basal spur anterior, rounded, 4 mm. in diameter and length, villous; tube 3.2 mm. in diameter at base, gradually dilated upward and 8 mm. in diameter at the throat, villous throughout; limb spreading, about 2 cm. wide, its lobes broadly rounded, entire, delicately and remotely reticulate; stamens 4, attached just above the base of the corolla; filaments 1 mm. wide at the flat base, adnate to the corolla for 2 mm., the free portion 23 or 27 mm. long, outwardly curved above the middle and then inwardly curved, bringing the anthers together in 2 pairs; anthers 2-celled, broad, the thecae divergent at base, confluent at the apex; disk fleshy, truncate-triangular, 1.7 mm. long, on the dorsal side of the ovary; ovary wholly superior, ovoid, flattened laterally, 3.5 mm. long, densely villous with ascending hairs 1–1.5 mm. long; style filiform, 21 mm. long, minutely sericeous; stigma somewhat cyathiform, nearly 2 mm. in diameter (Pl. 35, fig. 2).

Waterfall at Agüita, 3100 ft., *878;* spreading over rocks, the leaves variegated, the flowers mauve. Its nearest relative appears to be *E. hirsuta* Benth.

Episcia cuneata Gleason, sp. nov. Caulibus diffusis prostratis forsan repentibus; petiolis elongatis parce pubescentibus; laminis membranaceis oblongo-lanceolatis acuminatis argute serratis et minute ciliatis basi longe cuneatis et

ad petiolum decurrentibus subtus ad venam mediam parce pilosis ceterum glabris, venis supra planis subtus leviter elevatis, lateralibus arcuatim adscendentibus; paniculis basalibus longipedunculatis, pedicellis gracilibus; sepalis suberectis lanceolatis acuminatis glabris; corolla tubulosa parva glabra basi saccata, limbi patuli lobis ovato-oblongis rotundatis; filamentis inclusis superne curvatis; antheris ovatis in juga conniventibus; disco carnoso dorsale; ovario glabro ellipsoideo, stylo crasso curvato, stigmate obliquo.

Stems spreading and possibly creeping, the leaves crowded at the end; petioles elongate, as much as 10 cm. long and always nearly equaling the blades, thinly pubescent with jointed hairs, glabrescent with age; blades thin, dark green, oblong-lanceolate, as much as 18 cm. long by 4 cm. wide, long-acuminate, sharply and deeply serrate, minutely ciliate, long-cuneate at base and more or less decurrent on the petiole, minutely and sparsely appressed-pilose on the midvein beneath, otherwise glabrous; veins plane and obscure above, lightly elevated beneath, the laterals about 1 cm. apart, curved-ascending; panicles numerous, on nearly glabrous, slender peduncles 5–10 cm. long, becoming thinly pilose in the branches; pedicels very slender, 10–15 mm. long; sepals thin and herbaceous, erect or somewhat spreading, lanceolate, 4 mm. long, 1 mm. wide, long-acuminate, somewhat recurved at the tip where they are slightly carinate, glabrous; corolla 10 mm. long over all, glabrous, merely saccate at base, where it is 2.7 mm. in diameter, the tube slender, not expanded upward, the limb 7 mm. wide, the lobes broadly ovate-oblong, 3 mm. long; stamens 4, included; filaments adnate to the corolla for 1.5 mm; curved above into a half-circle, bringing the ovate anthers together in pairs; disk a thick and fleshy, lingulate, brown gland on the dorsal side of the ovary, 1.2 mm. long, and 4 nearly terete, separate glands 0.6 mm. long, on the ventral side.

Waterfall at Agüita, 3100 ft., *879*, described by the collector as a spreading herb with smooth green leaves and white flowers. I know of no named species of *Episcia* with which ours may be compared. Its leaf-form is similar to that of *Schomburgk 3379*, from British Guiana, with hairy leaves, and *Altson 372*, from the same country, with hairy leaves decurrent to the base of the petiole.

LENTIBULARIACEAE[1]

Lowland species

ARANELLA FIMBRIATA (HBK.) Barnh. East Swamp, Esmeralda, *270;* widely distributed from Florida to eastern Central America and Paraguay.

Calpidisca amethystina (St.-Hil. & Girard) Barnh., comb. nov. *Utricularia amethystina* St.-Hil. & Girard, Ann. Sci. Nat. Bot. II. **11**: 162. 1839.

[1] By John Hendley Barnhart.

East Swamp, Esmeralda, *269;* Lesser Antilles and Venezuela to Uruguay.

Calpidisca hispida (Lam.) Barnh., comb. nov. *Utricularia hispida* Lam. Tab. Encyc. **1:** 50. 1791.

East swamp, Esmeralda, *267;* Trinidad to Venezuela and Brazil.

SETISCAPELLA PUSILLA (Vahl) Barnh. East Swamp, Esmeralda, *271;* West Indies and Mexico to Colombia and Paraguay.

Species of Mount Duida

GENLISEA RORAIMENSIS N. E. Brown. Slopes of Ridge 25, 5500–6000 ft., *442;* Central Camp, 4800 ft., *1020;* otherwise known only from the summit of Mount Roraima.

ORCHYLLIUM ALPINUM (Jacq.) Barnh. Valley Head, 5000 ft., *699;* on mountain summits, Lesser Antilles to Venezuela.

Orchyllium Schimperi (Schenk) Barnh., comb. nov. *Utricularia Schimperi* Schenk, Jahrb. Wiss. Bot. **18:** 230. 1887.

Savanna Hills, 4400 ft., *826;* epiphytic; from the Lesser Antilles through northern South America to Central America.

ORCHYLLIUM CAMPBELLIANUM (Oliver) Gleason. Slopes of Ridge 25, 5500–6000 ft., *432;* Peak 7, 6900 ft., *673;* epiphytic on mossy tree-trunks; otherwise known only from the upper slopes of Mount Roraima.

Orchyllium Humboldtii (Schomb.) Barnh., comb. nov. *Utricularia Humboldtii* Schomb. Verh. Beförd. Gartenb. Preuss. **15:** 141. 1840.

Crest of Ridge 25, 6300 ft., *408;* summit of Peak 7, 7100 ft., *637;* without locality, *1011;* Ridge 16, *1012;* all growing in leaf-bases of bromeliads except *1011*, which grew in the soil; otherwise known only from the vicinity of Mount Roraima and its slopes.

Calpidisca modesta (A. DC.) Barnh., comb. nov. *Utricularia modesta* A. DC. Prodr. **8:** 17. 1844.

Ridge 24, 5600 ft., *477;* Central Camp, 4800 ft., *549;* Colombia and Venezuela to Bolivia.

SETISCAPELLA SUBULATA (L.) Barnh. Central Camp, 4800 ft., *547;* widely distributed in eastern North America, the West Indies, and northern and eastern South America.

ACANTHACEAE[1]

Lowland species

MENDONCIA SPRUCEI Lindau. New growth in burned forest at Middle Camp, Esmeralda, *342;* also in northwestern Brazil.

[1] By E. C. Leonard.

RUBIACEAE[1]

Lowland species

LADENBERGIA LAMBERTIANA (Mart.) Klotzsch. Rocky top of Esmeralda Ridge, *206*. A small tree, occurring in the upper Amazonian region of Brazil, and in southern Venezuela.

REMIJIA HISPIDA Spruce. Rocky top of Esmeralda Ridge, *214;* among bushes at base of Esmeralda Ridge, *277*. A shrub; known only from this locality, the type having been collected here by Spruce.

SIPANEA GLOMERATA HBK. In second growth, Santa Isabel, Rio Negro, *98*. Venezuela and northern Brazil; an erect herb, sometimes woody at the base with densely clustered, yellow flowers about 2 cm. long; fruit capsular.

SABICEA AMAZONENSIS Wernham. Yucabí, on the Rio Negro, *128*. Occurring in northern Brazil and southern Venezuela. A stout woody vine, the leaves densely felted beneath.

ALIBERTIA BERTIERIFOLIA Schum. River banks and flood sands, Muyrapenima, *67*. The type material of this shrub was collected at Manáos, Brazil.

RETINIPHYLLUM SCHOMBURGKII (Benth.) Muell.-Arg. Tree Savanna, Esmeralda, *321*. Also in British Guiana, Surinam, and Brazil. The species is reported from Roraima, but the altitude at which it occurs there is not recorded. Tate describes the plant as a shrub with white flowers and translucent red fruit.

Ixora duidae Standl., Field Mus. Pub. Bot. **7**: 412. 1931. A tree, glabrous throughout, the branchlets slender, olivaceous, somewhat compressed, the internodes elongate; stipules erect, subpersistent, lance-linear, striate; leaves thick-membranaceous, short-petioled, the blades oblong or elliptic-oblong, acuminate, acute at the base; inflorescences axillary, cymose-paniculate, very lax, many-flowered, the very slender peduncles 5—11 cm. long; flowers sessile or on pedicels 2 mm. long or less; calyx obtusely dentate; corolla small, hypocrateriform, the lobes broadly oblong, obtuse, less than half as long as the tube.

Hillside at Foothills Camp, 750 ft., *392*. The leaves suggest those of the Brazilian *Ixora membranacea* Muell.-Arg., but that has a quite different, terminal inflorescence. Very few species of *Ixora* with axillary inflorescence

[1] By Paul C. Standley. The Duida collections contain two genera and twenty-two species considered to be new to science. In order to avoid delay in the printing of his studies on the Rubiaceae of Venezuela, Mr. Standley has published these new genera and species elsewhere and only abbreviated descriptions are given here.

are known, and this plant does not seem to be closely related to any of the American ones.

FARAMEA ANGUSTIFOLIA Benth. & Hook. A shrub in forest, San Gabriel, Rio Negro, *136*. The species is known only from this general region of northern Brazil.

CEPHAELIS BARCELLANA (Muell.-Arg.) Standl. Middle Camp, Esmeralda, *371;* Santa Isabel, on the Rio Negro, in forest, *89*. Also in the Amazon Valley of Brazil and Peru, and occurring on Mount Duida. A shrub with large red bracts, dense heads of small yellow flowers, and blue fruits. This species is closely related to *C. tomentosa* (Aubl.) Vahl. In that the pubescence of the leaves consists of widely spreading hairs, while in *C. barcellana* the hairs along the costa and veins are rather closely appressed.

GEOPHILA HERBACEA (Jacq.) Schum. Foothills Camp, 750 ft., *395*. A slender creeping herb with long-petioled heart-shaped leaves; flowers small and white; fruits red, juicy, usually black at maturity. The plant is generally distributed in the lowlands of tropical America, often as a weed in cultivated ground, especially in banana plantations.

GEOPHILA TRICHOGYNE (Muell.-Arg.) Standl. Middle Camp, Esmeralda, *1006*. A slender creeping herb with long-petioled heart-shaped acute leaves, the small flowers in stalked headlike inflorescences. Ranging widely in the Amazon Valley of Brazil and Peru.

PSYCHOTRIA PATENS Sw. Caxoeira San Sebastián, Rio Casiquiare, *150*. A slender shrub with narrow thyrsiform inflorescence, one of the widely distributed species of tropical America.

PSYCHOTRIA INVOLUCRATA Sw. Middle Camp, Esmeralda, *374*. One of the widely distributed species of tropical America. A shrub with purplish black fruits.

PSYCHOTRIA RACEMOSA (Aubl.) Willd. In forest at Foothills Camp, Esmeralda, 750 ft., *396;* San Gabriel, on the Rio Negro, *139*. A shrub with black fruit. From most of the species of *Psychotria* this is easily distinguishable by its normally 5-celled fruit, that of other species being 2-carpellate. The species is one of those most widely distributed in the American tropics.

PSYCHOTRIA RHODOTHAMNA Standl. Middle Camp, Esmeralda, *948*, *955*. Occurring also in the Amazon Valley of Peru. A shrub or small tree with white flowers.

PSYCHOTRIA SANTAREMICA Muell.-Arg. Middle Camp, Esmeralda, *373*. Widely dispersed in the Amazon Valley of Brazil and Peru and in Colombia. A shrub with white fruits.

PSYCHOTRIA BRACTEATA DC. Caxoeira San Sebastián, Rio Casiquiare, *151*. Ranging through French and British Guiana, and in northern Brazil. A shrub, the inflorescence with numerous linear bracts.

PSYCHOTRIA RHODOLEUCA Muell.-Arg. In forest, Santa Isabel, Rio Negro, *94*. A shrub, very similar to the last preceding species. The type was collected at San Carlos on the Rio Negro.

PSYCHOTRIA LUPULINA Benth. Left bank of the Rio Casiquiare at Quemapure, *167*. The species ranges from the Guianas to Brazil, Bolivia, and Colombia. It is a shrub with small inflorescences subtended by broad bracts.

PALICOUREA LONGIFLORA DC. Santa Isabel, Rio Negro, *985*. Apparently a slender shrub. Known also from the Guianas.

PALICOUREA TRIPHYLLA DC. Middle Camp, Esmeralda, *956*; Santa Isabel, Rio Negro, *85*. Ranging from Bolivia to the Guianas, Trinidad, and Central America. A shrub with ternate leaves, the flowers in narrow thyrsoid panicles; peduncles orange; corolla yellow.

PAGAMEA CORIACEA Benth. Rocky top of Esmeralda Ridge, *196;* Foothills Savanna at Esmeralda, *943*. The species is known only from Esmeralda.

PERAMA GALIOIDES Poir. Grand Savanna, Esmeralda, *290;* East swamp, Esmeralda, *266;* in open savanna, Esmeralda, *180*. A low slender herb with narrow leaves and short headlike flower spikes; flowers yellow. The species is known only from southern Venezuela and northern Brazil.

DIODIA HYSSOPIFOLIA (Willd.) Cham. & Schlecht. Yucabí, Rio Negro, *976*. A weedy species, widely distributed in Brazil, the Guianas, and Colombia.

BORRERIA ALATA (Aubl.) DC. Muyrapenima, Rio Negro, on river banks and flood sands, *54*. Occurring in the Guianas and northern Brazil.

BORRERIA LATIFOLIA (Aubl.) Schum. Santa Isabel, Rio Negro, in sandy soil in open ground, *78*. Widely distributed in tropical America; a common weed in many regions.

An unidentified sterile specimen from woods at Foothills Camp, *385*, is probably a species of *Anisomeris*.

Species of Mount Duida

REMIJIA TENUIFLORA Benth. At Agüita, 3100 ft., *930*. A small tree. Occurring also in British Guiana and along the Rio Negro in Brazil. Although the Mount Duida specimen is noteworthy for its large and many-flowered inflorescences, and for the large leaves with almost perpendicular

veins, probably it is no more than a form of *R. tenuiflora*, and I see no easy means of distinguishing it specifically.

Remijia laevifolia Standl., *op. cit.* 359. A large shrub, the young branches stout, glabrous, the internodes 1–1.5 cm. long; stipules caducous, about 2.5 cm. long, acute, sparsely strigose; leaves coriaceous, very shortly petioled, the blades oblong or narrowly elliptic-oblong, acuminate, at the base acute, glabrous; inflorescences axillary, cymose-corymbose, long-peduncled, very dense and many-flowered; flowers sessile; calyx 5-lobate to below the middle, the segments narrowly lance-triangular, long-acuminate, capsule elliptic-oblong, 7–10 mm. long, rather densely appressed-pilosulous.

Dry ridge-tops, Savanna Hills, 4400 ft., *802*. The plant represented by the type specimen evidently is closely related to *R. tenuiflora* Benth., but it seems to be fairly distinct, although ampler material may show that it can not be maintained as a separate species. *R. tenuiflora*, according to type and other material, differs in having much longer petioles, less strongly coriaceous leaves, a much laxer inflorescence, and more slender capsules.

Ladenbergia lucens Standl., *op. cit.* 362. A straggling tree, completely glabrous except possibly on the corollas (corollas not seen); stipules caducous, lance-oblong, acuminate; leaves petiolate, thick-coriaceous, the blades oblong-elliptic to elliptic-ovate, slightly narrowed toward the rounded or very obtuse apex, at the base broadly rounded, bright green and very lustrous on the upper surface, beneath much paler; inflorescence terminal, laxly cymose-paniculate, few-flowered, on a stout peduncle 2–4 cm. long, the flowers chiefly on short stout pedicels; calyx deeply 5-fid, the segments triangular, acuminate.

Bank of a stream at Central Camp, 4800 ft., *558*. The material upon which this description is based is incomplete and far from satisfactory for study, but it seems to represent a species unlike any illustrated in the large series of the genus found in the herbarium of the Field Museum. Since it is improbable that the plant will be re-collected soon, it is perhaps best to give it a name, although the writer realizes that already too many species have been proposed in *Ladenbergia*.

HILLIA PARASITICA Jacq. Desfiladero, 6000 ft., *710*. A straggling bush with slender branches and thick leaves; flowers white, with a long slender tube. Widely distributed in tropical America. The plant usually is epiphytic, and the branches sometimes are more or less scandent.

Chalepophyllum Tatei Standl., *op. cit.* 379. A shrub, the branches stout, the older ones covered by the persistent stipules; stipules connate halfway to the base, densely whitish-strigose; leaves almost sessile, the blades thick-coriaceous, elliptic-oblong, 12–27 mm. long, acute, glabrous; flowers axillary, solitary, on short pedicels as much as 4 mm. long; hypanthium

densely white-hispidulous; calyx-lobes lance-linear, subequal, erect, sparsely hispidulous; corolla-tube 6.5–11 cm. long, its lobes 1.5–3 cm. long.

Summit of Peak 7, 7100 ft., *623* (type); slopes of Ridge 25, 5500–6000 ft., *427*; without data, *1016*. Of the genus *Chalepophyllum* two species have been published heretofore, the type, *C. guyanense* Hook. f., described from some uncertain locality of British Guiana, and *C. speciosum* N. E. Brown, obtained on Mount Roraima at an elevation of 2680 m. The original illustration of the type shows a plant with comparatively small flowers, and altogether different in general appearance from *C. Tatei*. The latter, however, is evidently closely related to *C. speciosum*, that species differing from *C. Tatei* in its more or less obovate, obtuse leaves and glabrous stipules. There is no doubt that *C. Tatei* is congeneric with *C. speciosum*, but there is considerable doubt in the writer's mind regarding their relationship with *C. guyanense*. Their status can not be resolved, however, without access to material of *C. guyanense*, and perhaps to better material than is afforded by the type specimen.

Chalepophyllum latifolium Standl., *op. cit.* 379. A shrub, with densely leafy branchlets and glabrous internodes; stipules connate into a glabrous sheath 2–2.5 mm. long, the free portion triangular-subulate, densely white-hispidulous near the base; leaves sessile, thick-coriaceous, oval, broadly rounded to obtuse at the apex, rounded at the base, glabrous; flowers axillary, solitary, on stout pedicels 2–3 mm. long; hypanthium densely hispidulous; calyx 5-parted, the segments linear-lanceolate, slightly unequal, ciliate but otherwise glabrous; corolla-tube 4–9 cm. long, the lobes oblong or elliptic-oblong, 1.5–3 cm. long; capsule globose or oval-globose, densely hispidulous.

On moist slopes of Savanna Hills, 4400 ft., *730*. It may be that this plant is only a variant of *C. Tatei* Standl., but it differs so much in the size and shape of the leaves and in the form of the stipules that it seems fairly safe to describe it as distinct. Both these species must be handsome plants, because of their profusion of large flowers, which presumably are white, although the collectors of the various species of the genus have vouchsafed no information upon flower color. In all the three species described since the original one, the size of the corolla seems to be exceptionally variable for members of the Rubiaceae.

Gleasonia Standl., op. cit. 372

Trees, the branchlets thick and hirsute. Stipules intrapetiolar, large, persistent, deeply bilobed. Leaves opposite, short-petioled, thick-coriaceous, oblong or elliptic-oblong. Flowers large, rose-color, bracteolate, sessile or pedicellate in many-flowered, terminal, pedunculate cymes. Hypanthium hemispheric, densely hirsute. Calyx 5-parted, the lobes large, subequal, elongate,

ligulate-spatulate, colored, rounded at apex. Corolla infundibuliform, densely hirsute and tomentose externally, the tube straight, densely pilose within, the lobes 5, imbricate, broadly ovate, obtuse, densely pilose within. Stamens 5, inserted at the base of the throat, subequal, included, the filaments very short, glabrous, the anthers linear, obtuse, dorsifix. Disc depressed-annular. Ovary 2-celled. Style thick, appressed-pilose, the two branches oblong, obtuse. Ovules numerous, densely crowded. Fruit not seen, apparently capsular.

Gleasonia duidana Standl., *op. cit.* 372. Branchlets subterete, stipules ferruginous, densely appressed-hirsute; leaves 14.5–21 cm. long, rounded or obtuse at the apex and short-apiculate, obtuse or acutish at the base, glabrous above, beneath hispidulous and along the costa appressed-hirsute; cymes repeatedly branched, the branches densely fulvous-hirsute, the bracts linear to ovate-lanceolate, hirsute or hispidulous (Pl. 39, fig. 2).

The Valley, 5000 ft., *467* (type); Central Camp, 4800 ft., *1026*. When growing this must be an exceedingly showy and handsome plant. The form of the calyx-lobes and the general appearance of the inflorescence is strongly suggestive of the genus *Triplaris* Loefl., which contains some of the most gorgeous of tropical American trees.[1]

Because of the absence of fruit and the uncertainty whether the seeds are winged or not, there is some question as to the tribal position of the tree, but it is probable that it is referable to the *Rondeletieae*, and allied with *Pallasia* Klotzsch and *Pteridocalyx* Wernh., both of which are natives of British Guiana. However, it is conspicuously distinct from both these two genera, in which only one or two of the calyx-lobes are enlarged and colored. In *Gleasonia* all the calyx-lobes are about equally developed, and all are brightly colored. Such a calyx is not found in any other American representative of the family Rubiaceae.

Retiniphyllum erythranthum Standl., *op. cit.* 399. A shrub, apparently densely branched, the young branches rather densely rough-puberulent; stipules 2–3 mm. long; leaves petiolate, the blades coriaceous, oval to broadly elliptic or oblong-elliptic, rarely oblanceolate-oblong, usually rounded or obtuse at the base, at the apex rounded or very obtuse and shortly apiculate, glabrous and shining on the upper surface, beneath paler, strigose along the costa, elsewhere glabrous; flowers terminal, few, clustered in a headlike inflorescence, closely sessile; involucel saucer-shaped, nearly entire; calyx shallowly dentate; corolla red, thinly sericeous outside, the lobes oblong, obtuse or acutish, reflexed; stamens exserted; pyrenes shallowly sulcate and obtusely costate dorsally.

[1] Large cream-colored inflorescences of this handsome tree were generally scattered through the *Tyleria* forest of Central Camp near the stream. The tree extended well toward Valley Head Camp and was also seen in one or two of the valleys along the southwest trail.—G.H.H.T.

Slopes at Central Camp, 4800 ft., *561* (type); summit of Ridge 25, 6000 ft., *465;* dry slopes of Savanna Hills, 4400 ft., *756*. The collector describes the plant as a "spindly shrub" with hard leaves and red calyx and corolla.

The genus *Retiniphyllum* is a rather isolated one in the Rubiaceae, being referred usually to a separate tribe, and being confined in its distribution chiefly to the Amazon Valley. The present species is referable to the subgenus *Commianthus* Muell.-Arg., in which it is noteworthy for its sessile headlike inflorescence.

Duidania Standl., *op. cit.* 408

Shrubs or trees, the branchlets thick, subterete or angular, glabrous, with elongate internodes. Stipules persistent, erect, short, connate, intrapetiolar, abruptly acuminate-apiculate. Leaves thick-coriaceous, short-petioled, opposite, the blades broadly oval or rounded, broadly rounded and apiculate at the apex. Flowers medium-sized, cymose-corymbose, the inflorescences terminal, sessile, very densely many-flowered, the flowers densely crowded, sessile or very shortly pedicelled, the bracts often foliaceous. Hypanthium small, obovoid. Calyx 5-parted, the lobes elongate, linear-filiform. Corolla hypocrateriform, puberulent or hispidulous, in the bud obtuse, the tube slender, smooth within, the 5 lobes valvate, narrowly oblong, attenuate, obtuse. Stamens 5, inserted on the throat of the corolla; filaments very short; anthers linear, dorsifix acute, subexserted. Disc depressed. Style filiform, glabrous, the 2 branches very short. Ovary 2-celled, the loculi 1-ovuled, the ovule attached to the middle of the septum. Capsule small, globose, coriaceous, terete, densely puberulent, septicidally 2-valved, 2-seeded. Seeds hemispherical, smooth.

Duidania montana Standl., *op. cit.* 409. Leaves more or less rugose, rounded or obtuse at the base, glabrous above, beneath paler, densely and minutely ochraceous-tomentulose, the margin often subrevolute; hypanthium densely ochraceous-puberulent; calyx-segments erect, hispidulous or puberulent (Pl. 38).

Slopes of Ridge 25, 5500–6000 ft., *420*. Although it is represented by complete and fairly ample material, the tribal position of this plant is not altogether clear, especially because of the unusual structure of the fruit. There are very few Rubiaceae that have capsular fruit with a single seed in each cell. The only American genus that seems to be related is *Ceratopyxis* Hook.f., a shrub native in Cuba. That is referred to the *Chiococceae*, where, however, it is anomalous because of its dry fruit, that of most members of the tribe being fleshy. *Ceratopyxis* differs conspicuously from the Mount Duida plant in its compressed capsules and in having the stamens inserted at the base of the corolla-tube, nor is it very similar in general appearance.

The peculiar appressed minute pale tomentum found on the under surface of the leaves of *Duidania* is not a common type of pubescence in the family, being found chiefly in the genus *Guettarda*, to which I do not believe that *Duidania* is closely related.

Pagamea montana Gl. & Standl., *op. cit.* 421. A shrub or small tree, glabrous except for the corollas, the internodes very short; stipules connate into a sheath 7–9 mm. long and bearing at the apex 8 slender teeth; leaves short-petiolate, the blades thick-coriaceous, oblong or narrowly elliptic-oblong, acute, gradually attenuate to the base; peduncles terminal and produced from the upper leaf-axils, 1–2.5 cm. long, the numerous sessile, 4–5-parted flowers crowded in a dense headlike cluster, calyx shallowly dentate, the teeth broadly triangular, acutish; corolla-lobes lanceolate, twice as long as the tube, densely white-villous within.

Dry ridge tops, Savanna Hills, 4400 ft., *803* (type); Agüita, 3800 ft., *926*. This species is related to *P. coriacea* Benth., which grows in the lowlands of the same general region. The latter has obtuse leaves, ovate calyx-lobes, longer stipules, and branched peduncles.

Pagamea garryoides Standl., *op. cit.* 420. A low shrub, the branches subterete or tetragonal, almost hidden by the persistent stipules; stipules densely sericeous; leaves short-petiolate, coriaceous, the blades elliptic or less frequently oblong-elliptic, acute or subobtuse, at the base obtuse or acute, above lustrous, at least when young covered with subappressed white hairs, beneath paler, densely pilose with spreading or subappressed hairs; flowers crowded in dense, subglobose, many-flowered heads on elongate, simple or 3-branched peduncles which are terminal or from the upper axils; calyx-lobes narrowly oblong-triangular, minutely hirtellous, acute; corolla 5-fid, the lobes twice as long as the tube, minutely pilose outside, densely white-villous within.

Rocks above Caño Negro, Savanna Hills, 4200 ft., *819* (type); Brocchinia Hills, 4500 ft., *585;* slopes of Ridge 24, 5900 ft., *464*. In its copiously pubescent leaves this differs conspicuously from most species of the genus. According to the collector, the leaves when fresh are stiff and shining.

Pagamea conferta Standl., *op. cit.* 418. A low shrub, the older branches stout, with very short internodes; stipules connate into a truncate sheath bearing at the margin 4 or more subulate setae; leaves coriaceous, very shortly petiolate, the blades lance-oblong or narrowly lanceolate, very long and narrowly acuminate, short-pilose along the costa beneath; flowers subcapitate, the heads axillary, small, short-peduncled; calyx minutely pilose, its lobes narrowly oblong-triangular, attenuate, longer than the hypanthium.

Dry rocky slopes of the Savanna Hills, 4400 ft., *794*. This plant is closely related, uncomfortably so in fact, to *P. capitata* Benth., a common species of the lowlands of British Guiana. It seems reasonably distinct,

however, in its smaller and more densely pubescent leaves, borne on very short petioles, and also in its nearly sessile inflorescences, the peduncles in *P. capitata* being usually 1–3 cm. long.

CEPHAELIS BARCELLANA (Muell.-Arg.) Standl. Agüita, 4000 ft., *921*. Southern Venezuela, and along the Amazon in Brazil and Peru. A shrub with large dense flower-heads, subtended by two broad, bright red bracts. In the Mount Duida specimen the bracts have elongate green tips. I have seen similar specimens of this and the closely related *Cephaelis tomentosa* (Aubl.) Vahl, and am of the belief that they represent only a minor variation of the species, although it may be that they are of a greater significance.

PSYCHOTRIA HOFFMANNSEGGIANA (R. & S.) Muell.-Arg. Agüita, 3100 ft., *898*. A shrub with white flowers and purple fruit, occurring also in the Guianas and in the Amazon Valley of Brazil.

PSYCHOTRIA CRASSA Benth. Slopes of Ridge 25, 5500–6000 ft., *433;* summit of Peak 7, 7100 ft., *624*. Described as a small tree 6 m. high; flowers small and white, the fruit red, translucent. The description of the plant as a small tree may be incorrect, for usually this species is a small epiphytic shrub. It is sometimes difficult, however, to decide whether an epiphytic shrub really is such or whether it is a tree. This species occurs in British Guiana and Venezuela, and is known from the slopes of Roraima.

Psychotria durifolia Standl., *op. cit.* 444. A straggling shrub, glabrous throughout, the branches ferruginous and densely leafy; stipules short-connate, triangular, erect, persistent; leaves sessile, thick-coriaceous, broadly elliptic to rounded-ovate, broadly rounded to obtuse at the apex and with a short apiculation, at the base broadly rounded or truncate, the veins very oblique; inflorescences axillary, longer than the leaves, long-peduncled, cymose, densely rather few-flowered; flowers sessile; calyx deeply lobed, the lobes broadly triangular or oval-ovate, acute to rounded at the apex; corolla glabrous without, 5-fid almost to the middle, its lobes obtuse, fleshy, not barbate within.

Stream-side at Central Camp, 4800 ft., *556* (type); moist slopes of Savanna Hills, 4400 ft., *757*. The plant is one of striking appearance and puzzling affinities. Without fruit it is not at all certain that it is properly referable to the genus *Psychotria*, but it can not be referred to any other American group of the family. In its foliage it is somewhat suggestive of *Psychotria cordifolia* HBK., of Venezuela and British Guiana, but in that the inflorescence is terminal and thyrsoid. Axillary inflorescence is infrequent in the genus *Psychotria*, and I know of no species with such inflorescence which remotely resembles the present plant.

Psychotria vernicifolia Standl., *op. cit.* 462. Branches stout, fuscous or somewhat ferruginous, minutely puberulent, the internodes very short; stipules persistent, connate, bilobate to the middle, the lobes broadly rounded; leaves thick-coriaceous, short-petioled, the blades ovate or ovate-oblong, 3–5 cm. long, acuminate, rounded or obtuse at the base, glabrous; inflorescences terminal, sessile, 3-rayed, the rays hirtellous, each bearing a dense cyme of rather few sessile flowers, the bracts minute or obsolete; calyx shallowly dentate; corolla-tube slender, scarcely dilated above, densely and minutely puberulent outside.

Summit of Peak 7, 7100 ft., *628*. Related to *P. Everardii* Wernham, which was described from Roraima, the leaves of the two species being similar in size and shape. In *P. Everardii*, however, the inflorescence is pedunculate and the leaves have more numerous veins.

Psychotria coussareoides Standl., *op. cit.* 441. Glabrous except in the inflorescence, branchlets rather stout, grayish-ochraceous, subterete, the internodes short; stipules united into a persistent truncate sheath; leaves subcoriaceous, slender-petiolate, opposite or ternate, the blades oblanceolate-oblong or obovate-oblong, obtuse or acute, rather long-attenuate to the petiole, deep green and lustrous on the upper surface, much paler beneath; inflorescence terminal, long-pedunculate, cymose-paniculate, rather laxly many-flowered, the branches sparsely and minutely puberulent, the flowers sessile in small dense cymules, the bracts mostly small, triangular, acute; calyx shallowly and acutely dentate; corolla small, almost glabrous, the 5 lobes ovate, obtuse, slightly shorter than the thick tube.

Agüita, 4000 ft., *919*. A rather well-marked species, noteworthy for its chiefly ternate leaves, but uncertain relationship, as is so often the case with species of *Psychotria*.

Psychotria chondroloma Standl., *op. cit.* 440. A shrub, with rather slender, subterete, glabrous branches, the internodes elongate; stipules erect, persistent, connate, bilobed, the lobes short, triangular, acute; leaves thick-coriaceous, yellowish green, short-petiolate, opposite, the blades oblong-lanceolate, very long-acuminate, acute at the base, glabrous, with an indurate pale margin; inflorescence terminal, umbelliform, long-pedunculate, densely hirtellous, its rays rigid, spreading or ascending, bearing 1–3 dense headlike cymes; flowers numerous, sessile; bracts foliaceous, oblong or lanceolate, almost concealing the flowers; corolla funnelform, sparsely hirtellous outside.

Laterite Valley, Savanna Hills, 4400 ft., *726* (type); Agüita Slope, 3500 ft., *700*. Evidently a relative of *Psychotria transiens* Wernham, described from Mount Roraima, which has an inflorescence similar in structure but glabrous. The leaves of *P. transiens* are conspicuously different in form and venation from those of *P. chondroloma*.

Psychotria Tatei Standl., *op. cit.* 460. Shrub, the branches rather stout, subterete, olivaceous or fuscous, minutely puberulent, the internodes short or elongate; stipules persistent, connate, 2 mm. long, shallowly bilobate or subtruncate, the lobes obtuse; leaves thick-coriaceous, short-petiolate, the blades oval or ovate-oval, 3.5–6.5 cm. long, obtuse to broadly rounded at the apex and short-apiculate, yellowish green, glabrous above, beneath minutely pilose on the veins; inflorescence terminal, sessile, cymose-paniculate, laxly few-flowered, trichotomous from the base, the basal branches strongly reflexed, the flowers sessile, the bracts minute and inconspicuous; calyx-teeth broadly ovate, acute; corolla narrowly funnelform, densely puberulent outside, its lobes half as long as the tube.

Slopes at Central Camp, 4800 ft., *568* (type); *1039*. The second collection cited has smaller leaves than the type, but otherwise appears to be conspecific. The affinities of *Psychotria Tatei* are altogether uncertain, but it seems to be a well-marked species, notable for the reflexed lower branches of the inflorescence, and for the very thick and handsome leaves.

Psychotria phaneroneura Standl., *op. cit.* 455. Glabrous except in the inflorescence, the branches rather stout; stipules erect, persistent, connate, 2 mm. long, bilobate, the lobes broadly rounded; leaves thick-coriaceous, yellowish green, short-petiolate, the blades broadly oval or ovate-oval, 5–6 cm. long, acute to broadly rounded at the apex, broadly rounded at the base; inflorescence terminal, fastigiate-cymose, long-pedunculate, densely many-flowered, the branches minutely puberulent, the flowers closely sessile, the bracts inconspicuous, subulate; fruit 2-locular, very minutely puberulent, the pyrenes obtusely costate dorsally.

Dry laterite soil, Savanna Hills, 4400 ft., *789*. In foliage the present plant is almost exactly like *Psychotria Tatei* Standl., but the inflorescences of the two species are altogether different. It is rather probable that *P. phaneroneura* should be referred to *Palicourea* Aubl. rather than to *Psychotria*, but this can not be decided definitely until the flowers are available for study.

Psychotria duidana Standl., *op. cit.* 443. A shrub, glabrous throughout except on the stipules, the branches slender and fuscous; stipules persistent, united into a sheath 1–2 mm. long, the sheath more or less hirtellous, produced into 4 linear lobes; leaves short-petiolate, opposite, the blades subcoriaceous, ovate-oblong or narrowly ovate, long-acuminate, at the base obtuse or rounded; inflorescence terminal, long-pedunculate, cymose, naked and trichotomous at base, the primary branches 7 mm. long or less, the bracts ovate or lance-ovate, the inner somewhat shorter than the flowers; flowers sessile; calyx shallowly dentate, the teeth broadly triangular, acute; corolla glabrous outside, its tube 8–10 mm. long, more than twice as long as the lobes.

Desfiladero, 6000 ft., *713*. Related to *P. bracteata* DC., which differs conspicuously in its narrower bracts.

Psychotria campylopoda Standl., *op. cit.* 437. Shrub, the branches slender, subterete, fuscous or olivaceous, densely scaberulous-puberulent, the youngest somewhat angulate, the internodes short or elongate; stipules persistent, connate into a truncate sheath bearing at its apex 4 short subulate lobes; leaves small, coriaceous, short-petiolate, the blades elliptic-oblong or ovate-oblong, acute or acutish, acute at the base, minutely scaberulous on both surfaces or in age nearly glabrous; inflorescences terminal and from the upper axils, pedunculate, capitate, few-flowered, recurved, the outer bracts about 4, elliptic or oblong, apparently green; fruit bilocular, subglobose, minutely scaberulous.

Hillsides and flat ground at Central Camp, 4800 ft., *534* (type); slopes of Ridge 25, 5500–6000 ft., *412*. The leaves are much like those of *Psychotria oblita* Wernham, described from Roraima, but the Mount Duida plant belongs in Mueller's subgenus *Cephaelis*, group *Pseudocephaelidae*. It is described as a slender, straggling bush. The collector's notes state that the corolla-tube is yellowish white and the lobes purple, but I find no corollas on any of the specimens available for study.

Psychotria cacuminis Standl., *op. cit.* 436. Branchlets rather slender, subterete, ferruginous, glabrous, the youngest ones sparsely and minutely puberulent, the internodes elongate; stipules erect, persistent, connate, 2–4 mm. long, shallowly bilobate, the lobes broadly rounded; leaves coriaceous short-petiolate, opposite, the blades broadly ovate to oblong-ovate, long-acuminate, at the base rounded or obtuse, when young minutely puberulent along the veins on both sides and sometimes very minutely puberulent between them, or almost glabrous; inflorescence terminal, cymose-corymbose, rather densely few-flowered, long-pedunculate, the bracts obsolete, the flowers sessile or nearly so; calyx minutely and obtusely 5-toothed; corolla tubular-funnelform, densely furfuraceous-puberulent, in bud subtruncate at the apex, its lobes half as long as the tube.

Crest of Ridge 25, 6300 ft., *410*.

Psychotria ceratantha Standl., *op. cit.* 439. Shrub, the branches slender, fuscous, glabrous or the young ones obscurely puberulent, the internodes mostly elongate; stipules small, persistent, connate into a truncate sheath bearing at the apex 4 triangular obtuse lobes; leaves short-petiolate, thinly coriaceous, the blades oblong-elliptic or lance-oblong, 4–14 cm. long, long-acuminate, acute at the base, glabrous; inflorescence terminal, pedunculate, cymose-corymbose, laxly few-flowered, the branches strongly ascending, sparsely and minutely puberulent or glabrate; flowers disposed in few-flowered cymules, sessile or on stout pedicels scarcely 1 mm. long; calyx 5-fid to the

middle, the teeth triangular, acute or acuminate; corolla tubular-funnelform, minutely pulverulent outside, in bud with 5 short hornlike appendages at the apex, the lobes shorter than the tube.

Below the summit of Peak 7, 7050 ft., *669* (type); Desfiladero, 6100 ft., *712*. Like so many Psychotrias, the plant has no outstanding characters, but I have not been able to find a match for it among the South American species.

PALICOUREA MACROPHYLLA (HBK.) Standl. Agüita, 3100 ft., *886*. Ranging from Venezuela and British Guiana to Peru and Bolivia. A tree 7.5 m. high with large broad leaves; pedicels yellow; corolla white.

Perama scaposa Gl. & Standl., *op. cit.* 475. A slender annual, simple or with 1–2 branches from the base; lower leaves opposite, oblong-elliptic, the upper in a single whorl of 4, elliptic-ovate, 15–20 mm. long, densely villous on the upper surface, beneath villosulous on the nerves; inflorescence several times dichotomous or sometimes trichotomous, glabrous, almost naked and bearing only a few bracts scarcely 1 mm. long; flower-heads few, the peduncles almost filiform, 1–3 cm. long, about 10-flowered, the bracts linear, paleaceous; hypanthium paleaceous-pubescent; calyx-segments 2, fleshy, broadly triangular, acute, glabrous on the back; seeds globose, smooth, 0.7 mm. in diameter.

Summit of Peak 7, 7100 ft., *664* (type); sandy stream-bank at Central Camp, 4800 ft., *548;* Ridge 23c, *704;* Caño Sapo, 6200 ft., *597*. The corolla is described as white in some of the collections, and in one as blue. *Perama scaposa* belongs to the subgenus *Rosella* K. Sch., which is distinguished by subscapose habit and more or less rosulate leaves. The only other known species of the group is *P. dichotoma* Poepp. & Endl., recorded from the Amazon River and from Mount Roraima. In that the hypanthium is smooth and the seeds are 3-angled and punctate.

COMPOSITAE-EUPATORIEAE[1]

Lowland species

Eupatorium (§ CYLINDROCEPHALA) **Tyleri** Robinson, sp. nov. Frutex erectus, caulibus teretibus gracilibus breviter fulvidotomentellis, internodis plerisque 2–3 cm. longis. Folia opposita brevissime petiolata anguste ovata caudato-acuminata serrata basi cuneata 5–9 cm. longa 2–3 cm. lata distincte bicoloria supra obscure viridia (post exsiccationem fusco-brunnea) crispe puberula subtus fulvido-grisea breviter velutina paullo supra basin 3(–5)-nervia aliter pennivenia. Capitula ca. 11-flora parva vix 8 mm. longa pleraque breviter pedicellata in glomerulos paucos primo subsphaericos pani-

[1] By B. L. Robinson.

culatim dispositos aggregata. Involucri ca. 5-seriatim imbricati squamae ca. 20 subglabrae 3-striatae substramineae ciliolatae. Corollae glabrae 3 mm. longae. Achaenia 2.5 mm. longa basi conspicue attenuata.

A rather slender erect shrub; stems terete, shortly velvety with incurved or crisped slightly tawny grayish puberulence; internodes mostly 2–3 cm. long; leaves opposite, shortly petiolate, often proliferous in the axils, narrowly ovate, caudate-acuminate, finely serrate (the teeth 0.2–0.4 mm. high and 1–2 mm. wide at base), cuneate and entire at base, markedly discolorous, above dull green drying brownish gray, finely incurved-puberulent and gland-dotted, neither bullate nor rugose nor scabrid, beneath tawny gray, shortly velvety, rather obscurely 3(–5)-nerved from above the base, elsewhere pinnately veined, 5–9 cm. long, 2–3 cm. wide, thickish-membranaceous; petioles even of the largest leaves only 2–3 mm. long; panicle terminal, not obviously peduncled, opposite-branched, 7–15 cm. in diameter; heads about 11-flowered, scarcely 8 mm. long, shortly pedicelled or subsessile in terminal (at first subglobose) glomerules; phyllaries about 5-ranked, subglabrous dorsally, 3-striate, rounded at tip, ciliolate, closely appressed; corollas (probably purple) glabrous, 3 mm. long, without distinction of proper tube and throat; achenes nearly glabrous but minutely scabrid on the rather sharp angles, conspicuously attenuate at base, 2.5 mm. long; pappus of about 25 nearly smooth pale bristles equaling the corolla.

Rocky top of Esmeralda Ridge, *233*. This well marked species of § *Cylindrocephala* clearly approaches a plant of the Roraima Mountains, collected by Schomburgk and by him incorrectly identified with the Colombian *E. scabrum* L. f., from which it is clearly distinct, having smaller, mostly sessile heads, fewer florets and thicker, less attenuate and more shortly petioled leaves. From *E. Tyleri* this related species[1] of the Roraima Range differs in having harsher, conspicuously rugose leaves which are

[1] This plant seems to be undescribed. It may be here put on record as follows:

Eupatorium pharcidodes Robinson, sp. nov. Frutex ramosus, ramis teretibus fulvo-tomentellis, internodis 3–5 cm. longis. Folia opposita breviter petiolata ovata ad apicem obtusiusculum angustata basi rotundata vel subcuneata primo aspectu integra sed vero obscure lateraliter denticulata (dentibus utroque ca. 10 brevissimis) supra rugosissima scabridula atroviridia subtus fulvo-velutina 6–10 cm. longa 2.5–4.5 cm. lata, petiolo 2–5 mm. longo fulvo-tomentoso. Corymbi in caule ramisque terminales convexi 6–12 cm. diametro. Capitula ca. 8-flora sessilia vel breviter pedicellata in glomerulos subsphaericos aggregata. Involucri graciliter cylindrici squamae 6–7-seriatim imbricatae arcte adpressae apice rotundatae ciliatae dorso pallide brunneae tenuiter 3–5-nervatae. Achaenia nigra sed cum costis pallidis instructa deorsum attenuata sursum in angulis scabrida 3.5 mm. longa, pappi setis ca. 25 albidis. "*E. scabrum*" Schomburgk, Vers. Fl. Brit.-Guiana, 1077, 1848, not L. f.

In sparsely shrubby places on the southern slopes of Mt. Roraima, *Schomburgk*, no. *187.5* (type in herb. Royal Gard. Kew, phot. in Gray Herb.).

much less narrowed toward the tip and base and are subentire or but obscurely 8–10-toothed on each side instead of being, as in *E. Tyleri*, definitely serrate with 15–20 teeth on each side.

EUPATORIUM ODORATUM L. In forest, Santa Isabel, Rio Negro, northern Brazil, *76*. A species common throughout the warmer parts of America, variable and running to several conspicuously diverse yet by no means sharply definable strains. The plant of Tate here in question would be referable to *E. Maximiliani* var. *hispidum* DC. were that variety or even the species *E. Maximiliani* Schrad. capable of satisfactory delimitation from the more general concept of the older *E. odoratum* L.

Species of Mount Duida

Eupatorium (§ EXIMBRICATA) **Tatei** Robinson, sp. nov. Frutex ut videtur erectus, caulibus ramisve adscendentibus virgatis teretibus foliosis scabris densissime fusco-puberulis, capillis patentibus sursum curvatis acutis basi incrassatis et aetate papilliformibus. Folia opposita vel subalterna (paribus saepe paullo disjunctis) breviter petiolata elliptica vel obovata ad apicem versus paucidentata rigida punctata utrinque glabra ca. 3 cm. longa 1.2–1.8 cm. lata. Panicula terminalis convexa vel subpyramidata, pedicellis gracilibus flexuosis 3–8 cm. longis. Capitula ca. 6-flora 8 mm. alta; involucri squamis paucis dorso fusco-puberulis, principibus subaequalibus oblongis obtusis, extimis 2–3 lanceolatis acutis multo brevioribus. Achaenia 3 mm. longa scabrata deorsum attenuata.

A shrub with erect or ascending virgate terete and leafy branches, the stems, branches, petioles, pedicels and phyllaries covered with a close scabrid puberulence almost black in color. Leaves opposite or nearly so, narrowly obovate or more often elliptic, shortly few-toothed toward the obtuse to rounded apex, entire and subcuneate toward the base, rigid, glabrous and punctate on both surfaces, above slightly shining, 3-nerved from near the base, otherwise pinnately veined; petiole 2–3 mm. long. Panicle convex or low-pyramidal; heads small, about 6-flowered; phyllaries of two kinds, the inner oblong or even elliptical, obtuse or rounded at the tip, subequal and loosely imbricated, the outer (2–3) lanceolate, acute, much shorter. Corollas purplish, subcylindrical, about 5 mm. long. Achenes dark, about 3 mm. long, slightly tapering toward the base, scabrid; pappus-bristles 25–30, sordid (in dried material), equaling the corolla.

Slopes of Ridge 25, 5500–6000 ft., *414* (type); summit of Peak 7, 7100 ft., *641*. This endemic species in its habit, nigrescent pubescence and some other features recalls *E. fuscum* N. E. Br. of the Roraima Mountains, which may probably be regarded as its nearest known relative. However, the two are quite distinct, *E. fuscum* having broader, more ovate leaves, rounded at the base and pubescent beneath, 15–16-flowered heads, and acute inner phyllaries.

Mikania (§THYRSIGERAE) **duidensis** Robinson, sp. nov. Suffrutex vel frutex volubilis ubique cum pilis viscidis patentibus et saepissime retrorsis nodulosis fusco-purpureis obtectus. Folia (saltem caulina) opposita bene petiolata suborbiculari-ovata breviter acuminata basi sinu angusto cordata margine cuspidatim denticulata. Capitula subsessilia ad apices ramulorum brevium patentium inflorescentiarum lateralium vel terminalium aggregata; involucri squamis anguste oblongis apice rotundatis ca. 8 mm. longis dorso fusco-villosulis basi gibbosis et paullo incrassatis. Corollae glabriusculae, tubo proprio gracili, faucibus turbinato-campanulatis, dentibus limbi oblongis acutiusculis. Achaenia matura ignota.

A slender tough-stemmed somewhat lignescent twiner covered with a dark and viscid pubescence; internodes subterete, 8–15 cm. long, flexuous; nodes slightly thickened but destitute of stipuliform appendages; hairs jointed, attenuate, setiform, dark purple, spreading or reflexed, short, not capitate; leaves opposite, petiolate, the cauline suborbicular-ovate, shortly acuminate, at base cordate by a narrow sinus and with rounded basal lobes, obscurely and remotely cuspidate-denticulate, fuscous-pubescent on both surfaces, thickish in texture, 3–5-nerved from the base; the limb 4.5–6 cm. long, 4–4.5 cm. wide; petiole 2–2.5 cm. long, densely dark-pubescent; uppermost and rameal leaves smaller, suborbicular, obtuse or rounded at each end; panicles axillary or terminal, pedunculate, leafy-bracteate toward the base; heads glomerate at the tips of the spreading branchlets, subsessile; phyllaries narrowly oblong, rounded at tip, about 8 mm. long, coarsely dark-puberulent on the back, swollen and slightly corky toward the base; corollas subglabrous at maturity, the proper tube slender, 3.5 mm. long, the throat turbinate-campanulate, 2.5 mm. long; teeth oblong, acutish, 1.5 mm. long; mature achenes not known.

Slopes of Ridge 25, 5500–6000 ft., *426* (phot. and small fragm. in Gray Herb.); Burned Mountain, 6500 ft., *1050*. The type, which is the better specimen, is unfortunately overmature and though retaining its involucres has shed its florets. After careful search a single corolla was discovered adhering to the involucre but even this had dropped its achene. The second plant cited, namely no. *1050*, is clearly the same species though showing only the upper smaller and more obtuse leaves. It is in bud stage, but shows that the pappus-bristles are about 33 in number, smoothish, salmon-colored (after drying) and about the length of the corolla. In habit and indument this species differs much from any *Mikania* previously known in Venezuela. It slightly recalls *M. phaeoclados* Mart. of eastern central Brazil but has longer darker pubescence, somewhat larger, more pointed and more finely toothed leaves, longer and stouter petioles, as well as other differences.

COMPOSITAE–A NEW GENUS[1]

Among the collections obtained on the Tyler-Duida Expedition of 1928–1929 is a plant which at first sight was taken to be a *Senecio*. Critical examination, however, proved it to be not of this genus, but apparently an undescribed member of the Compositae of doubtful generic affinity. The alternate or scattered leaves, the two- to three-seriate somewhat stramineous bracts of the involucre, the naked conical receptacle, and the numerous unequal scales of the pappus would seem to place the plant in question in the *Helenieae-Jauminae*, allied to *Geissopappus*. Further collections, however, may reveal a more definite relationship within the family. The unusual combination of characters warrants placing on record the following description:

Tyleropappus Greenman, gen. nov.

Capitula terminalia mediocria homogama discoidea. Involucrum campanulatum, bracteis 2–3-seriatis linearibus vel oblongis submembranaceis striatis plus minusve straminibusque, exterioribus brevioribus. Receptaculum conicum nudum. Corollae disci regulares, tubo brevi, limbo abrupte ampliato campanulato, apice 5-fido. Antherae basi obtusi vel brevi sagittatae, apice appendiculatae. Styli rami lineares, apice breviter conici obtusique. Achenia oblongo-linearia vel obconica. Pappi paleae numerosae uniseriatae inaequales. Plantae suffruticosae, ramis plus minusve dichotomis. Folia alterna.

Tyleropappus dichotomus Greenman, sp. nov. Fruticosa ca. 3 dm. alta; caule tereti plus minusve dichotomo-ramoso, ramis superne foliosis inferiore nudatis juventute dense hirtello-pubescentibus deinde glabratis et griseo cortice obtectis; foliis alternis sessilibus vel brevi-petiolatis linearibus vel anguste lanceolatis 0.5–2 cm. longis 1–2.5 mm. latis acutis integerrimis utrinque glabris subtus pallidioribus subpunctatisque, marginibus revolutis; capitulis ad apices ramulorum in subcorymbocymis dispositis sessilibus vel brevi-pedunculatis paucifloris; involucri squamis extimis linearibus vel linearilanceolatis acutisque, extimis oblongis obtusis striatis paululo stramineis glabris; corollis tubulo-campanulatis ca. 4 mm. longis profunde lobatis glabris vel parce glandulosis aurantiacis; tubo proprio ca. 1.5 mm. longo; faucibus abrupte ampliatis; achaeniis obconicis ca. 2 mm. longis sursum adpressohirsutis; pappi paleis numerosis anguste lanceolatis 2–4 mm. longis erosociliatis inaequalibus.

Pl. 39, fig. 1. Part of the type specimen, natural size. Pl. 40. A. Head ×8. B. Receptacle ×4. C. Involucral bracts ×8. D. Complete flower ×8. E. Flower after removal of pappus ×10. F. Corolla showing insertion of stamens ×10. G. Anthers ×10. H. Scale of pappus ×10. I. Pistil ×10. J. Mature achene with persistent pappus ×5.

[1] By J. M. Greenman.

Summit of Peak 7, 7100 ft., *605* (phot. and fragment in Herb. Missouri Bot. Gard.); a shrub 1 ft. high with yellow flowers.

The plant described above resembles *Dyscritothamnus filifolius* Robinson, but differs from that genus in several important details, particularly in the character of the involucre, absence of pales on the receptacle, in having a distinctly paleaceous instead of a setose pappus, in the shape of the corolla, and in the character of the style-branches.

The drawings illustrating this species have been made by Miss Josephine Darlington.

COMPOSITAE—REMAINING GROUPS[1]

Lowland species

Polymnia stenocarpha Blake, sp. nov. Herba (?) dichotoma, caule tenui dense patenti-piloso pilis articulatis; folia opposita parva ovata acuta vel acuminata basi rotundata vel subcordata crenato-serrata utrinque dense sordido-pilosa subtus reticulato-venosa brevipetiolata; capitula in apicibus caulis ramorumque 1–3 minuscula brevipedunculata aurea; involucri semiglobosi ca. 5 mm. alti phyllaria ca. 4-seriata subaequalia extima 2 ovata herbacea utrinque dense pilosiuscula interiora pauca dense puberula; radii 7 parvi; flores disci 20 steriles; paleae parvae angustae; achenia crassa quadrangularia paullum compressa glabra annulo crasso coronata.

Plant apparently herbaceous, 35 cm. high or more, a few times dichotomously branched; stem subterete, 2.5 mm. thick below, flexuous, solid, densely griseous-pilose with spreading or spreading-ascending hairs; internodes 1.5–4 cm. long; petioles naked, densely pubescent, 1.5–3 mm. long; blades ovate or oblong-ovate, 2.5–3.5 cm. long. 9–14 mm. wide, firmly herbaceous, crenate-serrate with about 7 pairs of small callous-pointed teeth incurved beneath the lower surface of the blade, above dull green, densely and rather softly pilose with tuberculate-based antrorse-curved hairs, beneath densely griseous-pilose with spreading or antrorse-curved hairs, 5-pli-nerved within 2 mm. of base of blade (the upper pair of nerves stronger, extending nearly to tip of leaf) and strongly prominulous-reticulate beneath; heads 1 cm. wide, 1–3 in forks of stem and at tips of branches, apparently recurving in fruit, on densely pilosulous pedicels about 5 mm. long; disk 5 mm. high, about 6 mm. thick; 2 outer phyllaries 6 mm. long, 4–5 mm. wide, 5-pli-nerved, obtusely pointed, the next ones subherbaceous above, the inner suborbicular-ovate, with subindurate many-vittate puberulous body and short scarious glabrous erose apex; receptacle flat; pales linear-lanceolate, acuminate, glabrous, 1-vittate, 3 mm. long; rays 4.5 mm. long, the tube pilose, 1.8 mm. long, the lamina wedge-obovate, 2.7 mm. long, 2 mm. wide, repand or biemarginate; disk corollas narrowly funnelform, sparsely pilose at base, 3.5 mm. long (teeth 5, tri-

[1] By S. F. Blake.

angular, 1.1 mm. long); disk achenes abortive, glabrous, 0.4 mm. long; ray achenes bluntly quadrangular with rounded faces, 2.5 mm. long, 1.5 mm. wide, vertically raised-lineolate, brownish, glabrous, abruptly contracted at the truncate-rounded apex into a thick collar about 0.2 mm. high, epappose; style of disk flowers merely papillate, truncate, entire, not thickened above.

Rocky top of Esmeralda Ridge, *208*. This species, well distinguished from others of the genus by its small leaves and its solitary or few, short-peduncled, rather small heads, is aberrant in the oval-oblong, scarcely at all oblique, nearly evenly quadrangular ray achenes and the very narrow pales of the disk. The broad bracts subtending the ray achenes are flattish, concave in middle to receive the achenes, but not at all infolding them. These minor technical differences are by no means of generic importance.

ACANTHOSPERMUM AUSTRALE (Loefl.) Kuntze. Tinahy, Rio Negro, northern Brazil, *117*. Nearly throughout South America, but not on the Pacific coast; also (introduced) in the United States, Lesser Antilles, Hawaiian Island, and India.

ERECHTITES HIERACIFOLIA (L.) Raf. Yucabí, Rio Negro, northern Brazil, *127*. Widespread from Canada to southern South America.

Species of Mount Duida

BACCHARIS SCHOMBURGKII Baker. Summit of Peak 7, 7100 ft., *631;* otherwise known only from Mount Roraima. I cannot distinguish this specimen (staminate) in any way from a specimen in the U. S. National Herbarium of *Schomburgk 707* (also staminate), the type collection of the species. The locality was given by Baker as British Guiana only, but our specimen bears an original printed label giving the locality as Roraima. Perhaps this is the unidentified species related to *B. cassinefolia* DC. recorded by Oliver (without specific locality) and by Burkill from "summit" of Mount Roraima.

Calea abelioides Blake, sp. nov. Frutex ramosus semimetralis, ramulis hexagonis glanduloso-punctatis novellis parce incurvo-hispidulis, internodiis brevibus; folia opposita parva ovata acuminata basi rotundata pauciserrata glaberrima subtus dense glanduloso-punctata coriacea 5-pli-nervia et reticulato-venosa brevipetiolata; capitula 10-flora discoidea parva in apicibus ramulorum 3–9 umbellatim congesta, pedicellis 1–3 mm. longis; involucri gradati glabri 6 mm. alti phyllaria 2 exteriora lanceolata obtuse acuminata maxima ex parte herbacea 3–4 mm. longa; pappi paleae ca. 15 achaenio hispidulo duplo longiores.

Trichotomously branched undershrub, glabrous throughout except for some sparse puberulence on the youngest branches; stem and older branches

subterete, with grayish-brown bark, the younger 6-striate-angled, glandular in the grooves; internodes mostly 4–12 mm. long; petioles slender, 1 mm. long; blades 1.6–2.5 cm. long, 6–11 mm. wide, 3–4-serrate on each side mostly above the middle (teeth gland-tipped, about 0.3 mm. high, 2–5 mm. apart), somewhat shining above, densely dotted with yellowish glands beneath, the 2 lower pairs of veins arising within 1.5 mm. of base of leaf, the upper pair stronger than the lower and continuing practically to tip of leaf; pedicels obscurely puberulous, glabrate; heads cylindric-oblong, about 3 mm. thick; phyllaries graduate, the 2 outer sessile-glandular outside, the others about 5-seriate, broadly ovate to oblong or oblong-ovate, obtuse, with indurated several-vittate body and subscarious margin and tip, not ciliate; very young pales lanceolate, acuminate, lacerate toward apex; submature achene 1.5 mm. long; pappus paleae 15 or more, lance-linear, acuminate, hispidulous, 3.2 mm. long.

Ridge crests, Savanna Hills, 4400 ft., *768. Calea abelioides*, named from its striking habital resemblance to such species of *Abelia* as *A. chinensis* R. Br., is a member of the subgenus *Eucalea* and is well distinguished by its small, coriaceous, glabrous leaves, densely gland-dotted beneath, and its clusters of small, short-pedicelled heads. It belongs in a different subgenus from *Calea oliverii* Robins. & Greenm. (*C. ternifolia* Oliv., not HBK.), the endemic species of the Roraima region. *Calea ternifolia* Oliv. was described from the Arapoo River, which flows down from Roraima, but is mentioned by im Thurn[1] as one of the plants characteristic of the mountain.

Stenopadus Blake, gen. nov.

Frutices vel arbores, ramis saepius strigosis. Foliia alterna plusminusve obovata integra coriacea petiolata penninervia et reticulato-venosa vel 1-nervia et subevenia glabra vel mox subglabra. Capitula majuscula vel magna solitaria vel pauca terminalia homogama ca. 10–45-flora, floribus omnibus hermaphroditis uniformibus. Involucri obovoidei basi angustati valde gradati multiseriati phyllaria coriacea appressa maturitate decidua. Receptaculum planiusculum glabrum, paleis angustissime linearibus elongatis firmis flexuosis subpersistentibus flores subtendentibus onustum. Corollae regulares glabrae vel in apice tubi hispido-barbatae, tubo anguste infundibuliformi vel cylindrico limbi 5-partiti segmentis valde revolutis vel rigidis et erectis longiore vel subaequali vel 2–4-plo breviore. Achenia majuscula vel mediocria columnari-prismatica acute 4–5-angulata ca. 10–12-costata glabra, collari pappifero nullo. Pappi multiseriati gradati persistentis setae paullum complanatae minute hispidulae, intimis magis complanatis apice paullum dilatatis. Antherae caudato-sagittatae, appendicibus terminalibus lanceolatis acuminatis,

[1] Trans. Linn. Soc. Bot. II. 2: 260, 1887.

caudis lanceolatis acuminatis glabris vel hispidulis, contiguis connatis. Stylus supra serrulato-asperulatus glaber, ramis brevibus oblongis vel ovatis obtusis glabris erectis vel semipatentibus.—Species typica *S. talaumifolius*, n. sp.

A genus of the *Mutisieae-Gochnatinae*, allied to *Wunderlichia* Riedel and *Stifftia* Mikan, from both of which it is distinguished at once by the presence of very narrow pales on the receptacle at the base of each flower. The genus may be inserted in the system directly after *Wunderlichia*. In *Stifftia* (*Augusta* Leandro) the receptacle is naked, glabrous, shallowly and bluntly alveolate; the achenes are more or less fusiform with a short pappiferous collar, and (at least in *S. chrysantha* Mikan, type of the genus) distinctly flattened and 10-ribbed, with rounded, not in the least angled sides; the anther-tails are free; and the style is not serrulate-asperulous above. The corollas and pappus do not differ from those of *Stenopadus*. In *Wunderlichia* (of which I have examined only the unpublished *W. tomentosa* Glaz., evidently a very close ally of *W. mirabilis* Riedel, the original species), each flower is apparently completely surrounded by a series of stiff, deeply lacerate, irregularly connate, stramineous, glabrous pales about 2.3 cm. long, breaking up into narrowly linear, attenuate, lacerate divisions 1.5 mm. wide or less; the achenes, although somewhat 4–5-angled when young, are at maturity subterete, somewhat fusiform (distinctly contracted at least above), and about 10-ribbed; the pappus, in general features similar to that of *Stenopadus*, is deciduous in a ring or at least in large groups of bristles, and the plants are densely pannose- or lanate-tomentose, at least on the younger parts, with large suborbicular or broadly obovate leaves densely crowded at tips of branches. The styles and anthers do not differ essentially from those of *Stenopadus*.

The species of *Stenopadus* (*στενός narrow*, *ὀπαδός a follower*, from the narrow receptacular pales) divided naturally into two groups, which may be defined as follows:

Eustenopadus Blake, subgenus nov. Folia reticulato-venosa; corollae glabrae, limbi segmentis valde revolutis tubo brevioribus vel subaequalibus. Species typica *S. talaumifolius*, sp. nov.

Stomatochaeta Blake, subgenus nov. Folia 1-nervia subevenia; corollae in apice tubi annulo hispido-barbato donatae, limbi segmentis rigidis erectis tubum subduplo usque ad quadruplo superantibus. Species typica *S. crassifolius*, sp. nov.

Stifftia Connellii N. E. Br., considered by its author a connecting link between *Stifftia* and *Wunderlichia*, entirely agrees in essential characters with the two new species of the subgenus *Eustenopadus* described below and should be transferred to the present genus as **Stenopadus Connellii**

(N. E. Br.) Blake, comb. nov. Brown was of the opinion that when more species were discovered *Stifftia* and *Wunderlichia* would require to be united. The technical distinctions between the three groups here treated as genera are numerous and important, however, and the presence of recognizable group differences in gross characters strengthens the generic separations here made.

Stenopadus talaumifolius Blake, sp. nov. Arbor ramosa 6 m. alta, ramis crassis infra denudatis glabratis, novellis dense foliosis dense strigillosis; folia alterna obovata obtusa vel retusa basi cuneata petiolata integra coriacea penninervia reticulato-venosa glabra; capitula 1–3-na sessilia vel brevipedunculata majuscula ca. 15-flora homogama; involucri 3.8 cm. alti subcylindrici basi angustati valde gradati ca. 11-seriati appressi phyllaria coriacea strigillosa et ciliata glabrescentia exteriora ovata obtusa intima linearia acuminata; corollae 3.6 cm. longae glabrae, tubo limbi segmentis revolutis paullo longiore.

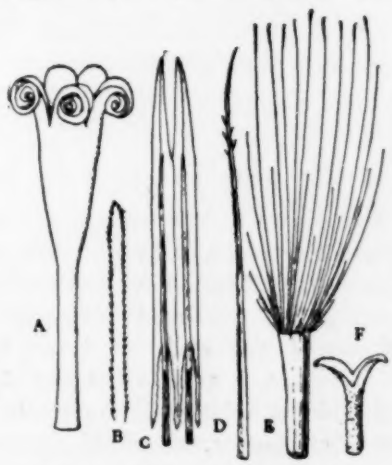


Fig. 6. *Stenopadus talaumifolius.*

Older branches subterete, striate, gray-barked, 5 mm. thick, those of the year gray-brown; internodes about 1–5 mm. long; petioles stout, 5–10 mm. long, narrowly margined above, strigillose, glabrate; blades 4.5–10.5 cm. long, 2.5–5.5 cm. wide, narrowly marginate, shining, light green above, lighter brownish-green and whitish-papillate beneath, the costa stout, prominent beneath, the principal lateral veins about 8–10 pairs, prominulous-reticulate on both sides; peduncles wanting or 1 cm. long, stout, strigillose; disk 4 cm. high, about 2 cm. thick in fruit; phyllaries (except the inmost) pale brown, coriaceous with thinner margin, the outermost ovate, about 3 mm. long, 2.5 mm. wide, the next ones ovate, 7–9 mm. long, 3–6 mm. wide, the middle ones lanceoblong to lanceolate, acute or acuminate to an obtuse apex, 1.5–2. cm. long, 3.5–6 mm. wide, the innermost somewhat thinner but firm, linear, acuminate,

1.5 mm. wide; receptacle flattish, glabrous, the pales very narrowly linear, 3 cm. long, about 0.4 mm. wide, about equaling the pappus, stiff, acuminate, minutely serrulate-hispidulous, the apex slightly dilated; corollas fleshy, the tube 1.8–2 cm. long, cylindric to middle, then funnelform, 3 mm. wide at apex, the throat none, the segments linear-triangular, acuminate, strongly revolute, 2-nerved, 1.6 cm. long; achenes columnar-prismatic, about 4-angled and 12-ribbed, 9 mm. long, glabrous, blackish-brown, not contracted at apex and without obvious pappiferous collar; pappus multiseriate, graduate, 2.3 cm. long, the bristles numerous, whitish, slightly flattened, hispidulous, the inner with somewhat dilated and bent tips, the outermost only 2 mm. long; anthers olive-green, 13 mm. long, the terminal appendages lanceolate, acuminate, about 3 mm. long, the sacs about 6.5 mm. long, the tails lanceolate, acuminate, 3.5 mm. long, backward-serrulate or hispidulous, those of adjacent anthers connate in pairs to apex; style finely serrulate-roughened above, the branches oblong, half-spreading, obtuse, glabrous, 1.3 mm. long. (Pl. 41.)

Fig. 6. A. Corolla ×2. B. Tip of one of the longer pappus-bristles ×10. C. Anthers ×4. D. Pale ×2. E. Achene (part of pappus omitted) ×2. F. Style-tip ×5.

Dryish slopes of Savanna Hills, 4400 ft., *759*. Distinguished from *Stenopadus Connellii* (N. E. Br.) Blake by its much smaller heads and narrower leaves, and from *S. eurylepis*, described below, by its about 15–flowered heads and much narrower phyllaries.

Stenopadus eurylepis Blake, sp. nov. Frutex ramis crassis dense strigosis; folia subconferta alterna obovata obtusa basi cuneata petiolata integra crasse coriacea penninervia utrinque prominulo-reticulata glabra, costa strigosa excepta; capitula solitaria sessilia majuscula 28–30-flora homogama; involucri gradati ca. 3.7 cm. alti phyllaria exteriora late ovata obtusa ciliata et dense rufescenti-strigosa media oblonga apice paullum dilatata intima linearia apice ciliata; corollae glabrae 3.8 cm. longae, tubo limbi segmentis dimidio longiore.

Branch about 5 mm. thick near tip, gray-strigose; branchlet of the year 3 mm. thick, angled, rufescent; petioles 8–13 mm. long, stout, naked, densely strigose; blades 5–12.8 cm. long, 2.3–5 cm. wide, normally obtuse, occasionally retuse or obcordate, often somewhat inaequilateral, scarcely marginate, somewhat shining, light-papillate beneath, penninerved, the lateral veins about 13–18 pairs, of which 7–8 pairs are stronger and anastomose near the margin; phyllaries with olive-brown base, deep brown upper portion, and narrow pale brownish margin, coriaceous with thinner margin, the outer 6–15 mm. long, 3.5–9 mm. wide, rounded, the middle ones 2.5 cm. long and 7 mm. wide, rounded, usually slightly contracted below apex, then barely ampliate, pubescent like the outer, the innermost linear, rounded or subtruncate, 2–3.5 mm. wide; pales very narrowly linear, 3.5 cm. long, about 0.2 mm. wide, firm, at apex slightly dilated and ciliate; corolla-tube 2.2 cm. long, narrowly funnelform, the throat wanting, the 5 segments of limb linear-triangular, acuminate,

strongly revolute, 1.6 cm. long, 1.5 mm. wide at base; achenes columnar-pentagonal, about 10-ribbed, 11 mm. long, about 1.8 mm. thick, glabrous, blackish-brown, shining; pappus multiseriate, graduate, 2.3 cm. long, whitish, the bristles slightly flattened, hispidulous, the longer slightly dilated at apex; filaments elongate, slender, triangular-dilated at base and there with a few bristles, the anthers 13 mm. long, the terminal appendages lanceolate, acuminate, connate below, 5 mm. long, the sacs 5.5 mm. long, the tails 2.5 mm. long, lanceolate, acuminate, those of adjacent anthers connate in pairs; style finely serrulate-roughened above, the branches not seen.

At Agüita, 3100 ft., *935*. The material examined consists of four tips of branches 6 cm. long or less, with numerous detached leaves, flowers, and achenes. Three of the branches bear receptacles, in two instances with a few persistent pales, but in all the involucres have fallen entirely and are represented only by loose phyllaries in the pockets, so that the description of the involucre given above is necessarily imperfect.

Stenopadus crassifolius Blake, sp. nov. Frutex 0.3 m. altus dichotome ramosus; rami crassi infra denudati densissime strigillosi, novellis rufescentibus; folia ad apices ramorum subconferta alterna obovata retusa basi rotundata integerrima plana crasse coriacea marginata crasse petiolata ad basin costae utrinque strigillosa ceterum glabra utrinque inconspicue papillata 1-nervia venis 3–4-jugis immersis; capitula in apicibus ramorum 1–2 sessilia vel brevipedunculata majuscula ca. 45-flora homogama; involucri ca. 7-seriati ca. 2.3 cm. alti phyllaria exteriora deltoideo-ovata acutiuscula coriacea ciliata ceterum glabra, intima angustissime linearia; corollae 2.7 cm. longae limbi 5-partiti segmenta 5 rigida erecta lineari-triangularia tubum apice intus hispido-barbatum duplo superantia.

Younger branches angulate, about 3 mm. thick, the older subterete, grayish, 5 mm. thick; internodes of young growth 3–15 mm. long; petioles flattened, densely strigillose, 5 mm. long; blades 3.3–7 cm. long, 1.5–3.5 cm. wide, often unequal at apex, rounded or cuneate-rounded and often unequal at base, brownish-green when dried, the thickened margin about 0.2 mm. wide; peduncles (present only when heads are paired, and then only in the lateral head) about 8 mm. long, thick, densely rufescent-strigose; disk of submature heads (excluding corollas) thick-cylindric, 3 cm. high; involucre strongly graduate, the outer phyllaries (several series) deltoid-ovate, 6–12 mm. long, about 6 mm. wide, acutish, coriaceous, chestnut-brown with narrow paler brown margin, densely pilose-ciliate, otherwise glabrous, the middle ones similar, lance-oblong, acuminate, 3–4 mm. wide, the innermost narrowly linear, acuminate, hispidulous-ciliolate, 0.7–1.5 mm. wide; receptacle flattish, the narrowly linear pales 2.4 cm. long, equaling the pappus, firm, acuminate, slightly dilated at apex, hispidulous-ciliolate; corollas apparently whitish, glabrous except for the dense hispidity at apex of tube within, the tube 9 mm.

long, the throat wanting, the lobes 1.8 cm. long, 0.8 mm. wide at base; achenes oblong, 7 mm. long, 1.5–2.5 mm. wide, about 10-ribbed, often obcompressed, more or less distinctly 4–5-angled, blackish-brown, glabrous, shining; pappus multiseriate, graduate, 1.8 cm. long, the numerous bristles (or setiform awns) becoming brownish, very numerous, persistent, slightly flattened, hispidulous, not thickened at apex, the short outermost ones only 4 mm. long; anthers 9.8 mm. long, the lanceolate acuminate terminal appendages yellowish, 3 mm. long, the sacs 4 mm. long, the lanceolate acuminate apically subobtuse tails 2.8 mm. long, connate in pairs, slightly retrorse-hispidulous; style at maturity

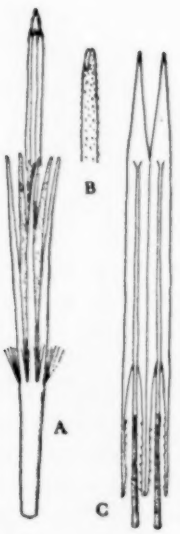


Fig. 7. *Stenopadus crassifolius.*

surpassing the stamens by 3 mm. or more, slender, toward apex slightly thickened and finely serrulate-roughened like the lower back of the style branches, these very short, erect, ovate, rounded, glabrous, 0.4 mm. long.

Fig. 7. A. Corolla ×2. B. Style-tip ×5. C. Anthers ×6.

Central camp, *1014* (type); slopes of Ridge 25, 5500–6000 ft., *415*.

Gongylolepis glaberrima Blake, sp. nov. Frutex ubique glaber, ramis crassis; folia alterna saepius conferta obovata obtusa vel retusa basi rotundata vel cuneata brevipetiolata integra crasse coriacea penninervia prominulo-reticulata; capitula solitaria sessilia terminalia majuscula 13–15-flora homogama; involucri 3.5 cm. alti valde gradati phyllaria extima ovata intima anguste oblonga omnia rotundata vel obtusa intima subscariosa, ceteris coriaceis; corollae bilabiatae 2.8 cm. longae; pappi 14 mm. longi gradati rufescentis setae pallulum complanatae minute hispidulae.

Shrub (or tree ?), strictly glabrous throughout; branches apparently simple, 5–8 mm. thick, usually strongly cross-ridged by the scars of fallen leaves; internodes usually 2–5 mm. long, sometimes up to 12 mm.; petioles 3–9 mm. long, about 5 mm. wide; blades cuneate-obovate to oval-obovate, 4–9 cm. long, 2–6 cm. wide, with very narrowly revolute margin, penninerved and densely prominulous-reticulate especially beneath, the lateral veins about 8–18 pairs, strongly anastomosing; involucre about 7-seriate, thick-cylindric, the phyllaries all appressed, the outer 6–8 mm. long, 4–6 mm. wide, coriaceous, deep chestnut brown, with paler brown border and narrow scarious margin, the middle ones similar but oblong or ovate-oblong, about 5 mm. wide, the innermost mostly scarious, 3.5–4 mm. wide, minutely erose at tip; receptacle flattish, short-hirsute, epaleaceous; corollas glabrous, the tube 1.4 cm. long, slender-funnelform, the outer lip triangular-oblong, 3-toothed, 6-nerved, 1.4 cm. long, about 4 mm. wide at base, the inner lip 2-parted, the segments revolute, lance-linear, 14 mm. long, 1.3 mm. wide at base; achenes columnar, 8 mm. long, about 10-nerved, deep brown, glabrous, bearing a pappiferous collar at apex; pappus multiseriate, graduate, 14 mm. long, rufescent, the bristles numerous, slightly flattened, minutely hispidulous, fragile, the outermost only 1 mm. long; anthers 15 mm. long, the terminal appendages lance-linear, acute, connate below, 3.5 mm. long, the sacs 6.5 mm. long, the tails 5 mm. long, lance-linear, acuminate to obtusish, finely hispidulous, all connate for about 2/5 their length or nearly to apex; style smooth, the branches oblong, 1.3 mm. long, subtruncate, obscurely 3-lobed, glabrous.

Summit of Peak 7, 7100 ft., *614*, *617* (type), *647;* ridge top, 6000 ft., *1013*. The material of this species is somewhat variable. No. *1013* has the only head in flower present in the specimens examined; the heads of no. *617*, from which the details of receptacle are taken, are not yet opened, and the other numbers are without heads. In no. *1013* the leaves are comparatively remote, the internodes being mostly 1 cm. long or somewhat more; in all the others the leaves are crowded and the branches strongly cross-ridged. In no. *647* and *1013* the leaves are larger and more cuneate-obovate, in the other two more oval-obovate and rounded at base. All appear, however to belong to one species. *Gongylolepis glaberrima* is distinguished from the only previously known species, *G. Benthamiana* Rob. Schomb., by its solitary sessile heads, and from *G. erioclada*, described below, by its completely glabrous character, as well as by its considerably larger heads. The relationships of the genus *Gongylolepis* Rob. Schomb., incorrectly referred by Bentham and Hooker to the synonymy of *Stifftia*, will be discussed by the writer in a forthcoming paper in the American Journal of Botany.

Gongylolepis erioclada Blake, sp. nov. Frutex ramis densissime subsericeo-piloso-tomentosis, aetate subglabratis; folia alterna crebra obovata vel ovalia

acuta vel obtusa basi rotundata vel cuneata integra coriacea utrinque parce piloso-tomentosa saepius glabrata penninervia reticulato-venosa; capitula solitaria sessilia terminalia 9-flora homogama; involucri ca. 2 cm. alti valde gradati phyllaria coriacea anguste scarioso-marginata glabra extima ovata intima anguste oblonga, omnia rotundata vel obtusa; corollae bilabiatae 19 mm. longae.

"Straggling bush, 3 m. high;" branches subterete, usually striate, about 3 mm. thick, at first very densely pilose-tomentose with subsericeous whitish hairs, in age finely gray-tomentulose; internodes 3–7 mm. long; petioles 2–4 mm. long, flattened, broad, pilose-tomentose, glabrescent; blades 2.5–6 cm. long, 1.2–2.3 cm. wide, with very narrowly revolute margin, above shining green, quickly glabrate or remaining thinly pilose, beneath lighter green, thinly pilose-tomentose (densely so toward base of costa) or glabrate, penninerved, the principal veins about 8–13 pairs, anastomosing, prominulous especially beneath; disk thick-cylindric, 2 cm. high; involucre 2–2.2 cm. high, about 6-seriate, appressed, the phyllaries comparatively few. with olive or deep brown, puncticulate, coriaceous body and narrow scarious margin (minutely erose above), the outer 4–7 mm. long, about 3.5 mm. wide, the middle oblong, about 4 mm. wide, the innermost narrowly oblong, 2.5 mm. wide; corollas glabrous, the tube 9 mm. long, the outer lip oblong, 3-denticulate, 10-nerved, 10 mm. long, 4.5 mm. wide at base, the inner lip 2-parted, the segments lance-linear, acuminate, 2-nerved, 10 mm. long, 1.3 mm. wide at base; achenes subcylindric, 8 mm. long, contracted above, then widened into a pappiferous collar, about 10-nerved, glabrous, brown; pappus multiseriate, graduate, 12 mm. long, rufescent, the bristles slightly flattened, hispidulous, the outermost only 2 mm. long; anthers 11 mm. long, the terminal appendages lanceolate, acute, about 2.5 mm. long, the sacs 5 mm. long, the tails 3.5 mm. long, linear, acutish, all connate for about half their length, slightly hispidulous; style glabrous, not enlarged above, the branches oblong, half-spreading, 2.2–2.5 mm. long, glabrous, subtruncate, irregularly 3–4-lobulate at apex.

Dry slopes of Savanna Hills, 4400 ft., *758*.

Duidaea Blake, gen. nov.

Frutices ramis infra denudatis, supra conferte foliosis. Folia alterna subacicularia vel anguste linearia coriacea integerrima 1-nervia subsessilia. Capitula ratione parva vel magna solitaria terminalia pedunculata homogama 9–21-flora, floribus omnibus bilabiatis uniformibus vel exterioribus labio exteriore plusminusve longiore. Involucri subcylindrici aetate subturbinati gradati multiseriati phyllaria triangularia ad oblonga vel intima linearia saepius acuminata vel acuta straminea vel pergamentacea, intima subscariosa, extima interdum subcoriacea. Receptaculum planum epaleaceum hirsutum. Corollae bilabiatae, labio exteriore 3-dentato erecto interiore 2-partito revoluto. Achenia plusminusve fusiformia subteretia ca. 10-costata plus-

minusve hirsuta vel hirsutula, collari pappifero nullo vel obscuro. Pappi non copiosi gradati pauciseriati straminei persistentis setae hispidulae vix complanatae. Antherae caudato-sagittatae, appendicibus terminalibus triangularibus acuminatis, caudis liberis linearibus plusminusve acuminatis hirsutulis vel subglabris. Styli laevis rami mediocres vel longi erecti vel subpatentes glabri rotundati vel subtruncati.—Species typica *D. Tatei*, sp. nov.

In Hoffmann's arrangement of the genera of this tribe, which is an improvement on that of Bentham, *Duidaea* falls in the subtribe Mutisinae. Its only close relative is *Gongylolepis* Rob. Schomb., which was wrongly referred to *Stifftia* Mikan by Bentham, who has been followed by all subsequent authors. Bentham's error is difficult to understand, since *Stifftia* is a member of the subtribe *Gochnatinae*, characterized by the regularly 5–parted corollas (at least in the disk), while those of *Gongylolepis* were described by Schomburgk as bilabiate. Although not distinguished from *Gongylolepis*, of which three species are now known, by very strong structural characters, the three species of *Duidaea* differ decidedly from that genus in habit, with minor differences in involucre, receptacle, achenes, pappus, anthers, and style branches, and are best treated as constituting an independent genus. The leaves of *Duidaea* are narrowly linear or subacicular and 1-nerved, those of *Gongylolepis* broad, penninerved and strongly venose; the heads of *Duidaea* are solitary and pedunculate, those of *Gongylolepis* solitary and sessile or several and loosely corymbed; the involucre of *Duidaea* is composed of comparatively thin, scarcely more than stramineous or pergamentaceous, mostly acute or acuminate phyllaries, that of *Gongylolepis* of strongly coriaceous, very blunt phyllaries; the receptacle of *Duidaea* is scarcely alveolate, that of *Gongylolepis* is strongly so; the achenes of *Duidaea* are pubescent at apex or throughout and are nearly or quite destitute of pappiferous collar, while in *Gongylolepis* the achenes are glabrous or obscurely puberulous and the pappiferous collar is conspicuous; the pappus of *Duidaea* is more scanty and of less flattened bristles, although these differences are not entirely constant; the anther tails are free in *Duidaea*, connate in *Gongylolepis;* and the style branches are mostly rounded in *Duidaea*, mostly truncate and often obscurely lobate in *Gongylolepis*.[1]

[1] The genus *Duidaea*, all of whose species when sterile or only in bud give an impression of wiry stunted pine seedlings, is peculiar to the exposed plateau of Duida. *D. rubriceps*, seen first on Brocchinia Hills, occurred also where the southwest trail crossed ridges, but nowhere so abundantly as at Savana Hills. *D. Tatei* was found only in the rocky gorge of the Caño Negro, where it rooted in crevices in the jointed rock a little below high-water mark. *D. pinifolia* is much more aquatic, being abundant in the rocky bed of the brook at Central Camp, where it rooted in crevices as *D. Tatei*, but was invariably covered by even a small rise of the stream.—G.H.H.T.

Duidaea Tatei Blake, sp. nov. Frutex ramis infra denudatis glabratis, novellis densissime foliosis piloso-tomentosis; folia alterna lineari-acicularia 1-nervia marginibus valde revolutis juventute laxe tomentosa mox glabrescentia; capitula mediocria solitaria terminalia pedunculata folia subaequantia 9-flora homogama; involucri ca. 6-seriati gradati 1.5–1.8 cm. alti phyllaria substraminea acuminata ad obtusa striata laxe pilosa et ciliata; corollae bilabiatae 2 cm. longae; achenia apice hispidula.

Branches usually simple, often in threes, the older dark brown, smooth, glabrous, 2–4 mm. thick, the younger cross-ridged, finely tomentulose, those of the year densely and loosely pilose-tomentose with ochroleucous hairs; leaves very crowded, erect or spreading, at first loosely tomentose, at maturity glabrate or usually pilose on costa beneath; petioles about 1.5 mm. long, as

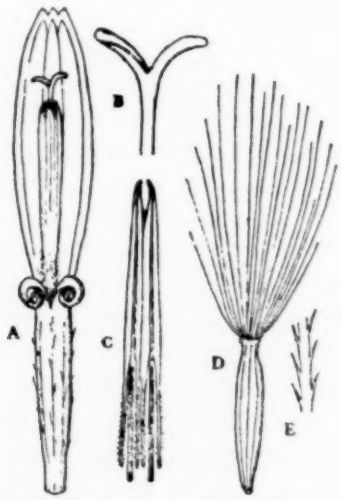


Fig. 8. *Duidaea Tatei.*

broad as the blade; blades 2.3–6.8 cm. long, 0.8–1.5 mm. wide, subulately callous-pointed, coriaceous, light or yellowish green, shining above, the margins often so strongly revolute as to conceal the costa; peduncles terminal or sometimes apparently axillary, 1.5–2 cm. long, slender, loosely pilose-tomentose, bearing near apex 2–3 triangular bracts about 2 mm. long; head (moistened) thick-cylindric, 2 cm. high, about 6 mm. thick, rounded at base; phyllaries about 24, whitish or brownish, often with reddish brown tips, the outer ones firmer, triangular or triangular-ovate, 2–6 mm. long, 1.5–2.5 mm. wide, the middle ones lance-oblong, acuminate to obtusish, 2.5–3.5 mm. wide, the innermost linear, acute to obtuse, 1.5–2.5 mm. wide, thinner and subscarious; receptacle densely hirsute; corollas apparently purplish, the tube 7 mm. long, hispidulous, the outer lip elliptic-oblong, 3-denticulate, 4-nerved, 12.5 mm. long, 3.5 mm. wide, the inner lip 2-parted, the segments strongly

revolute, linear-lanceolate, acuminate, 2-nerved, 0.5 mm. wide at base; achenes fusiform, plump, about 10-ribbed, 6 mm. long, brown, shining, sparsely hispidulous at apex, otherwise glabrous; pappus rather sparse, multiseriate, graduate, stramineous, 1 cm. long, the bristles scarcely flattened, not thickened at apex, hispidulous, the outermost only 1.5 mm. long; anthers 7 mm. long, the terminal appendages lanceolate, narrowed to an obtusish tip, 1 mm. long, the sacs 3 mm. long, the tails linear, 3 mm. long, acuminate, free, densely hirsutulous; style smooth, the branches oblong, widened above, spreading-ascending, rounded, glabrous, 1 mm. long (Pl. 42).

Fig. 8. A. Corolla ×5. B. Style-tip ×7.5. C. Anthers ×5. D. Achene ×5. E. Part of pappus-bristle ×20.

Gorge of Caño Negro, Savanna Hills, 4000 ft., *814*. Distinguished from *Duidaea pinifolia* Blake by its loosely and rather persistently pilose-tomentose branches, its strongly revolute-margined leaves, its pilose-tomentose peduncles, and only apically pubescent achenes.

Duidaea pinifolia Blake, sp. nov. Frutex ramis infra denudatis, novellis densissime foliosis inter folia dense breviterque tomentosis cito glabratis; folia alterna confertissima angustissime linearia subacicularia glabra 1-nervia; capitula mediocria solitaria vel bina terminalia 9-flora homogama pedunculata, pedunculis folia subaequantibus; involucri ca. 5-seriati valde gradati ca. 1.6 cm. alti phyllaria substraminea acuminata ad acuta parce pilosiuscula et ciliata vel ciliolata; corollae 1.5 cm. longae bilabiatae; achenia dense hirsuta.

Shrub 0.6 m. high, the older branches glabrous, smooth, brownish, 2.5 mm. thick, the younger cross-ridged; short growth of the year purple-brown, densely and compactly ochroleucous-tomentose between the bases of the leaves, quickly glabrate; leaves 2.5–7.5 cm. long, 0.7–1 mm. wide, obtuse or acutish, essentially sessile, purplish-red toward base, above dark or light green, somewhat shining, with prominent sulcate costa, beneath light yellowish green, the whitish costa prominent, about half as broad as blade, and somewhat produced laterally so as to make the lower surface of leaf 2-sulcate; peduncles terminal or subterminal, 2.5–5 cm. long, slender, glabrous, bearing a few subulate bracts 3–8 mm. long; involucre (moistened) subcylindric, 5 mm. thick, the phyllaries few (about 18) appressed, substramineous in texture, usually tinged with purple-brown, obscurely striate, the outer triangular or triangular-ovate, acuminate, 3–6 mm. long, 1.5–3.5 mm. wide, the middle ones oblong, acute or acutish, 4 mm. wide, the innermost similar but thinner and subscarious, obtuse or acutish, all finely erose-ciliolate and with scanty deciduous crisped hairs on back and pilose ciliation; receptacle short-hirsute; corollas "white," 15 mm. long, the tube and base of outer lip outside crisped-pilosulous, the tube 6 mm. long, the outer lip oblong, 3-denticulate, 4-nerved, 9 mm. long, 2.5 mm. wide, the inner lip 2-parted, the segments linear-tri-

angular, acuminate, 0.6 mm. wide at base, strongly revolute; achenes somewhat fusiform, 10-ribbed, 6 mm. long; pappus straw-color, rather scanty, graduate, 1.2 cm. long, the bristles very slightly flattened, hispidulous, the outer 2 mm. long; anthers 6.3 mm. long, the terminal appendages triangular-ovate, obtusish, 1 mm. long, the sacs 3.5 mm. long, the tails linear, acutish, free, finely serrulate toward tip, 1.8 mm. long; style smooth, the branches linear-oblong, truncate or truncate-rounded, erect, glabrous, 1.5 mm. long.

Streambed at Central Camp, 4800 ft., *530*.

Duidaea rubriceps Blake, sp. nov. Frutex ramis infra denudatis ad apicem densissime foliosis et pilosis; folia alterna linearia acutiuscula coriacea 1-nervia infra 2-sulcata primum tomentosa maturitate supra vel utrinque glabrata; capitula magna solitaria terminalia pedunculata 21-flora homogama; involucri ca. 8-seriati valde gradati ca. 3.5 cm. alti phyllaria substraminea vel exteriora subcoriacea oblonga ad linearia acuta margine tomentoso-ciliolata; corollae 2.5 cm. longae bilabiatae; achenia sparse hirsutula.

"Brittle shrub, 1 m. high," sparsely branched, the branches sometimes flexuous, the older fuscous-brown, smooth, glabrous, 3–4 mm. thick, the younger densely cicatricose, ochroleucous-tomentulose, the youngest densely leafy and densely ochroleucous-pilose with straightish hairs; leaves very crowded at tips of branches, on petioles about 1 mm. long, the blades 2.5–4.5 cm. long, 2–4 mm. wide, subacute, at first loosely and somewhat floccosely grayish- or ochroleucous-tomentose on both sides, soon smooth and shining above with the costa impressed or obscure, beneath more persistently gray-tomentulose but finally glabrate, yellowish-green, thick-margined, shallowly 2-sulcate beneath with broad rounded costa; peduncles 2–2.5 cm. long, slender, tomentose, glabrescent, bearing several subulate acuminate bracts 12 mm. long or less; involucre (moistened) cylindric-campanulate, about 1.2 cm. thick, the phyllaries loosely appressed, mostly purplish-brown, tomentose-ciliolate or at length only obscurely ciliolate, glabrous dorsally, with evident costa and several more obscure nerves, the outer phyllaries triangular, acuminate, similar to the bracts of peduncle, 1–1.2 cm. long, about 2.5 mm. wide, the middle ones oblong, acuminate, 6–8 mm. wide, the innermost thinner, linear, 2–3.5 mm. wide; receptacle densely short-hirsute; corollas "red," 2.5 cm. long, the tube puberulous, 6 mm. long, the outer lip linear, 3-denticulate, 4-nerved, 19 mm. long, 2.8 mm. wide, the inner lip 2-parted, the segments narrowly linear-triangular, acuminate, strongly revolute, 2-nerved, 0.4 mm. wide at base; achenes fusiform-oblong, 6 mm. long, light brown, about 10-nerved, bearing a short pappiferous collar; pappus graduate, 1.5 cm. long, rather scanty, straw-color, the bristles scarcely flattened, hispidulous, the outermost 5 mm. long; anthers 15.5 mm. long, the terminal appendages triangular, acuminate to an obtuse apex, about 2 mm. long, the sacs about 7.5 mm. long, the tails 6 mm. long, narrowly linear, acuminate, free, retrorsely or irregularly short-hirsute; style smooth, the branches erect, linear, obtusely rounded, glabrous, 3 mm. long (Pl. 43).

Brocchinia Hills, 4500 ft., *589* (type); Savanna Hills, 4400 ft., *1042*. Distinguished from both the other species by its broader and thicker leaves and larger heads.

MUSCI[1]

Lowland species

OCTOBLEPHARUM ALBIDUM (L.) Hedw. On rock, top of Esmeralda Ridge, *226;* on living and dead trees at Middle Camp, *334*; Asia, Japan, Hawaii, and warmer parts of America.

OCTOBLEPHARUM AMPULLACEUM Mitt. Among rocks, top of Esmeralda Ridge, *225;* northern South America.

LEUCOBRYUM MARTIANUM (Hornsch.) Hampe. Among rocks, top of Esmeralda Ridge, *224;* on living and dead trees at Middle Camp, *333;* Foothills Camp, 750 ft., *1065;* West Indies and northern South America.

SYRRHOPODON BERNOULLII C. Müll. At Esmeralda, *1064;* Guadeloupe and Central America.

Drepanophyllum duidense Williams, sp. nov. Statura et habitu *D. fulvo* Rich arcte consimile sed recedit foliorum parte superiore lata plusminusve truncata duplicato-serrata.

Plants sterile, growing in quite compact, rather dull, greenish-brown cushions, with more or less branching stems radiculose below, up to 3 cm. high, and usually bearing on the stout apex of the stem a cluster of reddish propagula, about 100μ long, with 10–12 cross-walls and tapering slightly in both directions from near the middle; cross-sections of stem about 60μ in diameter, showing no central strand, the ground-tissue of large, thin-walled cells and outer walls composed of about three layers of smaller, thick-walled cells; leaves complanate, very unsymmetric, spreading-recurved to one side, the larger up to nearly 3 mm. long and 0.8 mm. wide near the apex, the base only about half as wide as above, the margins flat and entire, except at the rounded or truncate, doubly serrate apex; costa narrow at base and slightly tapering upward, mostly percurrent or nearly so, the leaf-blade on one side very narrow, often scarcely evident about halfway up and usually widest near the apex; cells of leaf mostly elongate-rhomboidal with somewhat thickened, pitted walls, the basal becoming much more elongate with thicker, more flexuous and pitted walls.

Pl. 44. 1. Plant about natural size. 2. Lower stem-leaf ×20. 3. Upper stem-leaf ×20. 4. Median cells of leaf ×275. 5. Apex of upper leaf ×35. 6. Apex of stem with propagula ×35. 7. Basal cells of leaf ×320. 8. Propagulum ×80. 9. Cross-section of stem ×160.

Among rocks, top of Esmeralda Ridge, *222*. Very different from the only other known species in the broad, truncate-serrate apex of the leaf.

[1] By R. S. Williams.

RHIZOGONIUM SPINIFORME (L.) Bruch. Foothills Camp, 750 ft., *1062;* southern United States and warmer regions of the world.

PILOSIUM FLACCISETUM C. Müll. Foothills Camp, 750 ft., *1063;* Guiana and Bolivia.

SEMATOPHYLLUM GALIPENSE (C. Müll.) Mitt. Among rocks, top of Esmeralda Ridge, *223;* at Foothills Camp, 750 ft., *1061;* West Indies to Paraguay.

Species of Mount Duida

SPHAGNUM CAPILLACEUM TENELLUM (Schimp.) Andrews. Top of Ridge 24, 6300 ft., *482;* on Peak 7, 7100 ft., *482a;* widely distributed in North and South America, Europe and Asia.

SPHAGNUM MAGELLANICUM Brid. Top of Ridge 24, 6300 ft., *483;* widely distributed in the Americas and the Old World.

CAMPYLOPUS PRAEALTUS (C. Müll.) Par. Top of Ridge 24, 6300 ft., *485;* on Peak 7, 7100 ft., *485a;* known from Rio Janeiro and Porto Rico.

OCTOBLEPHARUM ERECTIFOLIUM Mitt. Sides and bed of creek at Provisional Camp, 6300 ft., *571;* Jamaica and Costa Rica.

OCTOBLEPHARUM PULVINATUM (Dz. & Mb.) Mitt. Top of Ridge 24, 6300 ft., *488;* Central America, northern South America.

LEUCOBRYUM GIGANTEUM C. Müll. Sides and bed of Creek at Provisional Camp, 6300 ft., *507;* Central America, northern South America.

Carinafolium Williams, gen. nov.

Genus *Octoblepharo* arcte simile sed differt carina manifesta ad partem costae basalem pagina dorsale, chlorocystis plerumque 4-angulatis perparvis et ad paginam dorsalem saepissime proximioribus.

Glossy yellowish-white plants of medium size. Stems without rhizoids, often branching in the upper part, in cross-section showing cells of nearly uniform size, all except the outer row with somewhat thickened reddish walls, the walls of the outer row thinner and hyaline. Leaves and cells much like those of *Octoblepharum* in structure, but the costa with a distinct keel extending from near the base about one fourth up the leaf on the lower side; the mostly 4-angled chlorocysts very small and rather nearer the dorsal than the ventral side of the leaf.

Carinafolium Tatei Williams, sp. nov. Caulibus ochroleucis laxe caespitosis saepe ramosis, ca. 3 cm. altis, sectione transversale 5-gonis, reste centrale nulla, cellularum corticalium pallidarum strato unico obtectis; foliis erecto-patentibus, paullum flexuosis, fere linearibus; costae carina ad partem folii quartam extendente.

Flowers and fruit unknown; growing in compact, glossy, yellowish-white tufts with erect, unbranched or slightly branched stems about 3 cm. high;

stems in cross-section more or less pentagonal, 0.15–0.20 mm. in diameter, without central strand, the cells all with thickened red walls, except the outer layer in which the walls are quite thin and pale; leaves nearly linear, up to 5 mm. long, erect-spreading, often slightly flexuous, acutely pointed, flat in upper part, the larger ones somewhat concave below and bearing on the under side of the costa a little above its base a distinct keel about one fourth the entire length of the costa; cross-sections in lower part of leaf show two layers of leucocysts across the greater part of the leaf except at the margins and along the thickened middle, with mostly very small 4-angled chlorocysts usually a little nearer the dorsal than the ventral side; median leaf-cells more or less rectangular with very thin, minutely pitted walls, and pores rather indistinct and slightly oval; the marginal blade-cells often very narrow about halfway up the leaf and in 3–6 rows; the costa at base narrowed, with blade of 4 or 5 rather wide cells on each side.

Pl. 45. 1. Plant about natural size. 2. Larger stem-leaf, showing keel ×14. 3. Two smaller leaves, not keeled ×14. 4. Apex of larger leaf ×125. 5. Part of base of same ×125. 6. Median leaf-cells from lower side of leaf ×180. 7. Cross-section of leaf near upper end of keel ×180. 8. Cross-section near best developed part of keel ×180. 9. Cross-section of stem ×180.

Without definite locality, 5700 ft., *1054*. The distinct keel toward the base on the back of the costa in the upper leaves seems to be unique in the Leucobryaceae.

MACROMITRIUM ULOPHYLLUM Mitt. On tree-trunk, High Point Camp, 6800 ft., *596;* northern South America.

FUNARIA CALVESCENS Schwaegr. On burned ground, Burned Mountain, 6700 ft., *684;* widely distributed in Europe, Asia, Africa and temperate and tropical America.

RHIZOGONIUM LINDIGII (Hampe) Mitt. Sides and bed of creek at Provisional Camp, 6300 ft., *513;* central and northern South America.

POLYTRICHUM ANTILLARUM Rich. On burned ground, Burned Mountain, 6700 ft., *683;* West Indies, Central America and northern South America.

HYPNELLA PILOTRICHELLOIDES Broth. Sides and bed of creek at Provisional Camp, 6300 ft., *508;* also known from British Guiana.

SEMATOPHYLLUM TEQUENDAMENSE (Hampe) Mitt. Near top of Peak 7, 7050 ft., *660;* Venezuela, Colombia, and Bolivia.

APPENDIX

Temperatures and weather on Mount Duida

Camp	Date	6 A.M.	2 P.M.	7 P.M.	Remarks
Foothills Camp	Nov. 15	79		81	
750 feet	" 16	76		79	Heavy rain during night.
" "	" 17	77		78	Day clear. Rain in evening.
" "	" 18	75			Showers in evening.
" "	" 19	75			
" "	" 20	73			Clear dry day and night.
" "	" 24	76		79	
" "	" 25	74		80	
Provisional Camp	" 27	63		67	
6300 feet	" 28	65		66	
" "	" 29	64		67	
" "	" 30	60	73	66	
" "	Dec. 1	54	76	68	
" "	" 2	62			
" "	" 7	58		62	
" "	" 8	62	67	63	
" "	" 9	59		64	
" "	" 10	59			
" "	" 11	61		63	
" "	" 12	61			
" "	" 13	62			
Central Camp	" 22	63		67	
4800 feet	" 23	62		68	
" "	" 24	64		67	
" "	" 25	63			
" "	" 26	63	72	66	
" "	" 27	59		68	
" "	" 28	63		67	Cloudy; showers at night.
" "	" 29	65		65	Rain all morning and night.
" "	" 30	64		64	Rain all morning; afternoon and evening clear.
" "	" 31	61	74	64	Night clear.
" "	Jan. 1	64	74	63	Heavy clouds during night; rain at 4 P.M.
" "	" 2	62		65	Morning clear. Rain in evening.
" "	" 3	56	75	64	Clear.
" "	" 4	61	71	64	Morning cloudy, clearing at 2 P.M. Rain in evening.
" "	" 5	64		66	Morning cloudy, clearing at 2 P.M. Rain in evening.

APPENDIX (*Continued*)

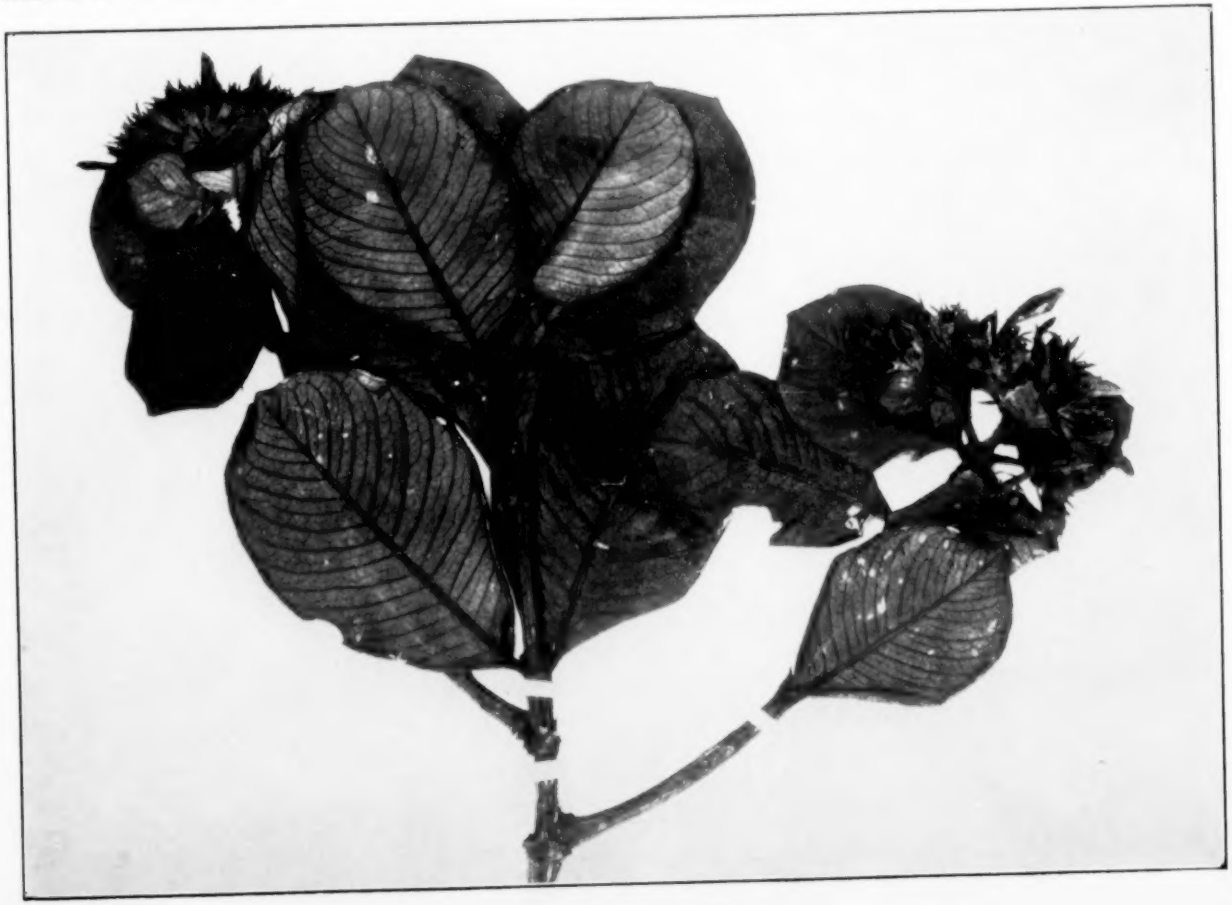
Temperatures and weather on Mount Duida

Camp	Date	6 A.M.	2 P.M.	7 P.M.	Remarks
" "	Jan. 6	64	78		Morning cloudy with heavy fog; afternoon clear.
" "	" 7	65		66	Morning cloudy; clear 2–5:30 P.M.; rain in evening.
" "	" 8	64		67	Morning cloudy; clear 2–5:30 P.M.; evening cloudy.
" "	" 9	63		64	Hazy.
Desfiladero	" 10	60		60	Clear only in early morning. Rain in P.M.
High Point 7100 feet	" 11	55		59	Clear only in early morning. Rain 6 P.M.
" "	" 12	57		62	Clear only in early morning. Night clear.
" "	" 13	56		62	Showers 4–8 P.M., clearing.
" "	" 14	53	58	62	Very clear in early morning; heavy fog during day.
" "	" 15	54	70	57	Very clear day. Strong northeast winds.
" "	" 16	56		60	Thick clouds and fog all day; clear in central valley.
" "	" 17	54		57	Early morning clear; cloudy, then clearing in P.M.
" "	" 18	54		58	Very clear day; night clear.
" "	" 19	54	68	62	Morning clear; rain in afternoon.
" "	" 20	56	72	58	Rain all day, clearing at 5:30 P.M.
" "	" 21	57	62	58	Early morning clear; clouds and light rain during day.
" "	" 22	57		58	Heavy clouds during day; strong NE. winds all night.
" "	" 23	56	65	59	Heavy clouds during day; strong NE. winds all night.
" "	" 24	58		60	Strong NE. wind with driving fog all day and evening; central valley clear.
" "	" 25	55		61	Intermittent cloud, increasing in P.M.
" "	" 26	54		61	Early morning clear, cloudy during day, clearing at 6 P.M., showers in central valley.
" "	" 27	58		61	Cloudy; light NE. wind with showers; central valley clear.
" "	" 28	56			Intermittent cloud all day; central valley clear.

APPENDIX (*Continued*)

Temperatures and weather on Mount Duida

Camp	Date	6 A.M.	2 P.M.	7 P.M.	Remarks
Agua Linda	Jan. 30	60		61	Clear at 6 A.M., clouded on scarp by 7 A.M.; clearing at 1:30 P.M.
" "	" 31	60		62	Heavy cloud to E. Thunderstorms in P.M. and night.
" "	Feb. 1	61		63	Heavy cloud, clearing at 4 P.M. Rain in evening; heavy rain at night.
" "	" 2	59		62	Morning very cloudy, clearing at 3 P.M.; Central Valley clear all day.
" "	" 3	60		63	Morning cloudy, light rain in P.M., clearing.
" "	" 4	57		60	Day and night clear and dry.
" "	" 5	54		60	Morning clear, clouding in P.M., night clear.
" "	" 6	56		62	Light NE. wind; showers in P.M., with increasing cloud.
" "	" 7	60		61	Rain all day, clearing in late P.M., night clear.
" "	" 8	57		62	Morning cloudy, rain 1–4 P.M., clearing.
" "	" 9	56		61	Clear all day and evening.
Savanna Hills	" 11		78	66	Day clear; heavy cloud to NE.
4500 feet	" 12	63		66	Thick cloud with rain from NE.; night clear.
" "	" 13	58		65	Morning clear; rain during night.
" "	" 14	61			Morning clear, clouding in P.M.; showers at 5:30; night clear.
" "	" 15	59			Morning clear; strong NE. wind and showers in late P.M.
" "	" 16	61			Morning cloudy, clearing.
" "	" 19	60		67	Morning clear, clouding at 4:30 P.M.; showers at 5 P.M. and all night.
" "	" 20	61	83	66	Clear day, strong NE. wind; rain at 4 P.M.
" "	" 21	62		65	Morning cloudy, clearing in P.M.; showers in evening, night clear.
" "	" 22	58			Fair all day.



DUIDANIA MONTANA X 3/4

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FIG. 1. TYLEROPAPPUS DICHOTOMUS

FIG. 2. GLEASONIA DUIDANA

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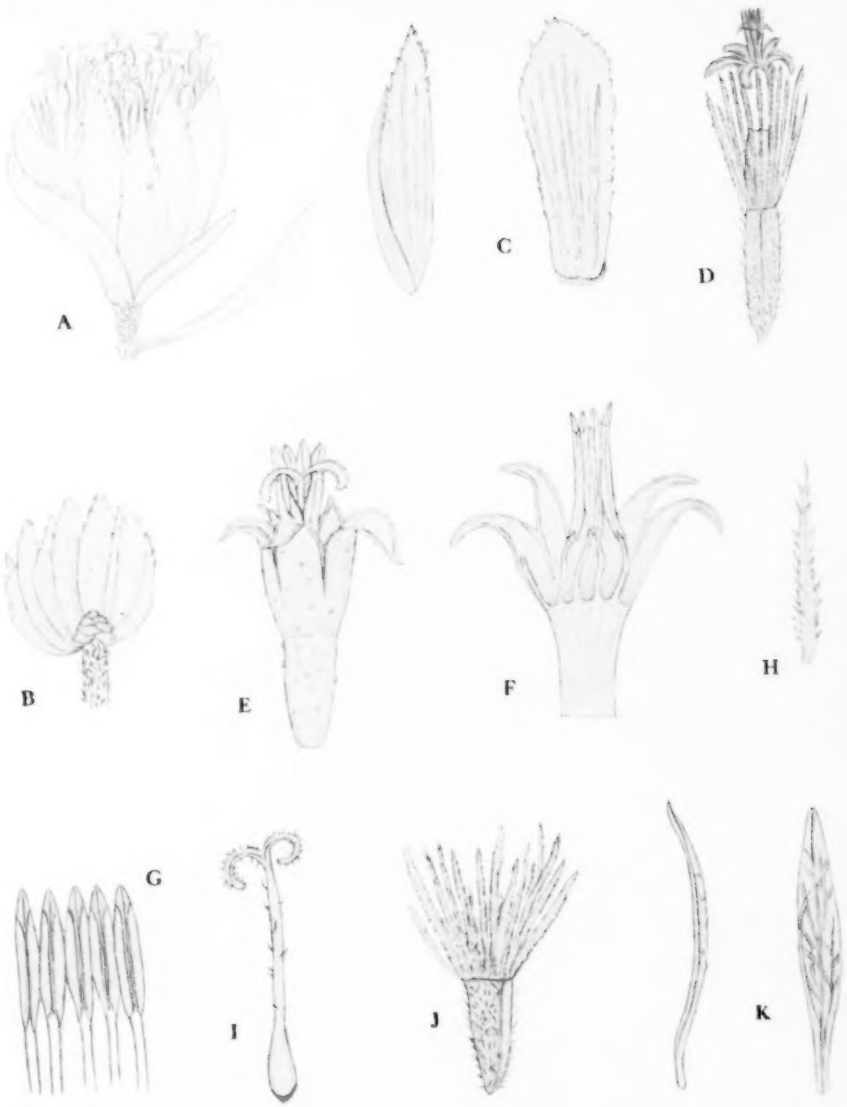

TYLEROPAPPUS DICHOTOMUS

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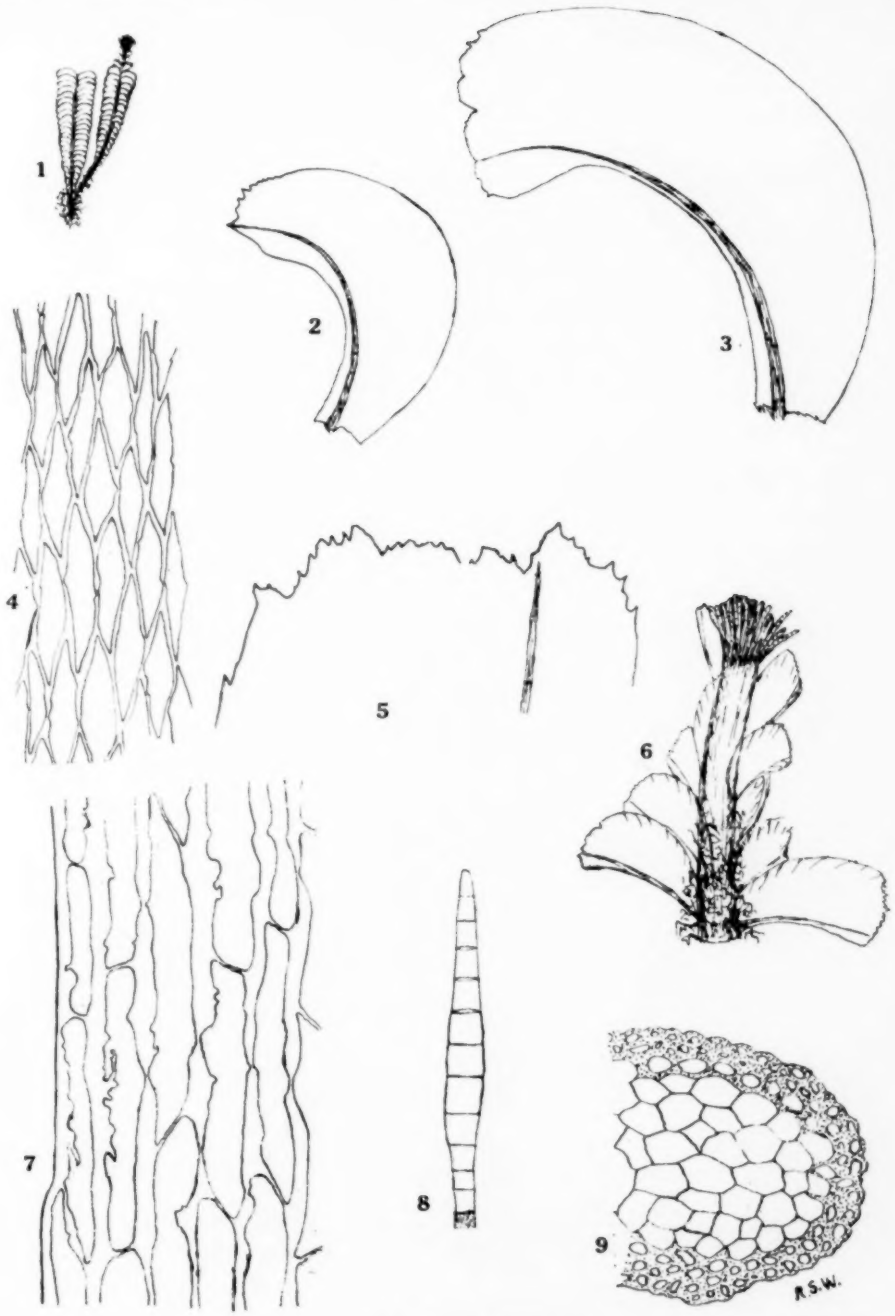
STENOPADUS TALAUMIFOLIUS ×1/2

UNIV OF ILL

DUIDAEA TATEI × 4/5

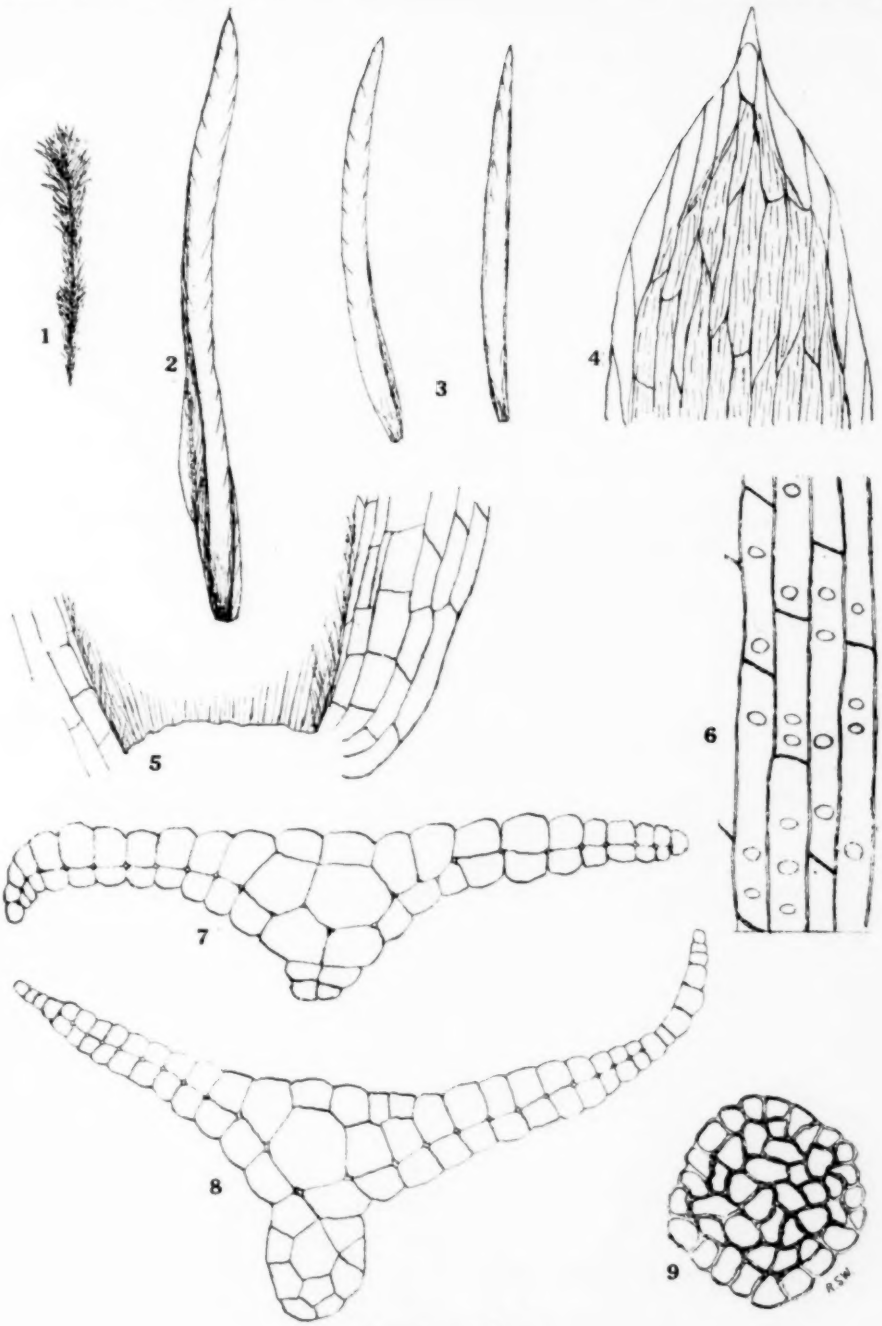
UNIV. OF MICH.

DUIDAEA RUBRICEPS



DREPANOPHYLLUM DUIDENSE

UNIV OF MICH



CARINAFOLIUM TATEI

UNIV. OF MICH.

INDEX TO AMERICAN BOTANICAL LITERATURE
1927–1931

The aim of this Index is to include all current botanical literature written by Americans, published in America, or based upon American material; the word America being used in the broadest sense.

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